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THE DIAGNOSIS AND TREATMENT OF SYPHILIS AND GONORRHEA.

By A. J. CASSELMAN, Acting Assistant Surgeon, United States Public Health Service.

1. A STATEMENT FOR HEALTH OFFICERS, PUBLIC HEALTH NURSES, AND OTHER PERSONS INTERESTED IN PUBLIC HEALTH.

The diagnosis and treatment of syphilis and gonorrhea is a medical problem, but the *control of the spread* of these diseases is a public health problem demanding the cooperation of health officers, nurses, social workers, and all other persons and agencies interested in the health of the public, as well as the physicians. In order to cooperate intelligently with the medical profession, the lay social worker must understand the principles of diagnosis and treatment of syphilis and gonorrhea.

Frequently before medical advice and treatment are sought, the social worker comes in intimate contact not only with the venereally infected person but with the family of the carrier as well. To the social worker is given the opportunity to educate the patient to seek proper treatment and to expect a continuance of treatment long after the symptoms of disease have disappeared.

The danger of transmitting syphilitic and gonorrheal infection through the marital relation, through illicit sexual intercourse, and, extragenitally, through intimate contact, is generally recognized by all who have any knowledge of venereal diseases; but the importance of early diagnosis and treatment in the eradication of syphilis and gonorrhea is not appreciated so generally. While a knowledge of the general principles of venereal-disease control is essential, the lay social worker must know the exact methods of diagnosis and treatment as well, and must make the facts known to the persons with whom he comes in contact if he is to give the most effective aid to the medical profession. With this thought in mind, the following statement has been prepared.

Syphilis.

The presence of a genital, or a suspicious extragenital, sore which refuses to heal promptly, indicates the necessity for a thorough and prolonged examination, whether the sore possesses the physical appearance of a typical chancre or not. During the first three weeks

of the existence of a suspected sore the microscopical examination is the only method we have for determining accurately the presence of syphilitic infection. If any antiseptic has been applied to the suspected chancre, this examination is deferred until after the sore has been cleansed with saline solution and a saline dressing applied for at least 24 hours. The social worker must advise patients not to undertake any treatment either by systemic remedies or by medicinal applications to the sore until after a positive diagnosis has been made by finding the germ of syphilis. If the sore is free of antiseptics, serum is squeezed out, and this specimen is examined immediately with the oil immersion lens of a microscope, illuminated through a dark-field condenser. If the chancre is less than three weeks old, and if the technique has been carried out properly, the organisms causing the sore should be discovered by this method; but the discovery may require many examinations. Even though many dark-field examinations be negative, the diagnosis of syphilis should not be excluded until at least three Wassermann reactions shall have been negative.

Soon after the sore appears, small glands in the vicinity become enlarged, and it is possible for the physician to obtain a pure culture of the syphilitic organism, if it is present, by drawing into a small syringe a few drops of the serum from one of these swollen glands. This is not a very painful procedure and is particularly useful when the diagnosis has been made more difficult by treatment of the sore with caustics or strong germicides.

In those sections of the country where physicians do not have access to a microscope illuminated with a dark-field condenser, the patient is sent to one of the many laboratories or clinics where this microscopical examination is made.

The organisms causing syphilis tend to disappear from the sore after the third week of its existence, and the microscopical examination becomes less satisfactory; but, if the infection is syphilitic, the Wassermann reaction becomes weakly positive during the third week; after that time it usually gives a strong positive reaction. The blood of a person infected with syphilis reacts to certain substances differently from the manner in which the blood of a normal individual reacts; the test for this reaction is called the Wassermann test, and the degree of reaction is indicated by the terms *plus one, plus two, plus three,* or *plus four. Plus four* may be considered as the minimum strength of reaction which, when obtained repeatedly, is considered diagnostic of syphilis in the absence of other signs. On account of practical difficulties, reactions stronger than *plus four* are reported by the same sign, even though they be many times this strength. Lesser degrees of reaction are considered doubtful and have little value when there is no other evidence of syphilis. A single negative is evidence

but not proof of the absence of the disease. A series of negative reactions continued over a period of years, unaccompanied by positive clinical symptoms of the disease, is commonly accepted as proof that the disease has been cured or that it did not exist.

The blood Wassermann reaction may remain strongly positive throughout the entire course of the disease, or during the latent and final stages the blood may give only a weakly positive or even negative reaction. In suspected syphilis, when the blood Wassermann gives only a weakly positive or negative reaction, the diagnosis may be confirmed by a Wassermann test of the spinal fluid, for the spinal fluid frequently remains positive long after the blood is negative. Because the spinal fluid may remain positive after the blood is negative, the patient whose treatment has been completed and who is being tested for cure, should not be discharged until a negative spinal Wassermann reaction has been obtained.

Throughout the various stages of the disease, patients infected with syphilis show characteristic symptoms, and, although the disease can be diagnosed only by a trained physician, the more common of these symptoms should be recognized by the health nurse or social worker. After the organisms have disappeared from the chancre and the blood Wassermann has become positive, a rash usually appears upon the body, the spots turning from a pink to a characteristic copper color. The rash is a result of the presence of a generalized infection which may be the cause of headache, fever, and depression as well. Although only an experienced physician can differentiate between a syphilitic rash and that caused by many other infections or agents, there is one manifestation of the disease which usually coexists with the rash which the health nurse and particularly the dentist should learn to recognize. During the secondary stage of the disease, ulcers usually appear on the lips or in the mouth or throat. These "mucous patches" frequently present a flat, raised surface, grayish or translucent in color, surrounded by a narrow and inflamed border. Since the syphilitic organisms abound in these patches and are liberated from them in sufficient numbers to make the saliva highly infectious, it is obvious that the person in this condition should be warned of his infectiousness, urged to seek medical diagnosis and treatment, and cautioned to guard against transmitting the infection until rendered noninfectious by proper antisyphilitic treatment. These lesions are practically painless, remain in the mouth for considerable periods, and have a characteristic appearance; therefore the school nurse, the general nurse, and the dentist, who make frequent examinations of the mouth, should discover many of these cases which otherwise would be missed.

If the disease follows the typical course, the secondary symptoms disappear and apparently the organisms become very much reduced

in number. The disease then enters upon a latent stage, of variable duration, during which the patient may present no symptoms of the disease and appear to be in good health. The late manifestations of syphilis are generally recognized by those interested in public health and by the educated public as well. During the latent stage, the disease reappears most frequently as a gumma, or as a nervous derangement; but the variations in the character of late syphilis are so great that they can not be discussed here. The gumma is a tumor-like growth which replaces normal tissue, breaks down, decays, and, if it disappears, is replaced by scar tissues. The gumma may attack the skin and bones, with consequent disfigurements, or it may attack the circulatory system or any of the vital organs. If death occurs it results usually through the failure of the affected organ to function. The disease may manifest itself by paralysis of the brain, the spinal cord, or the sensory nerves, resulting in paresis (general paralysis of the insane), locomotor ataxia, atrophy of the optic nerve, etc.

When cases of syphilis in the late stages, or children with hereditary syphilis are discovered, the health nurse or social worker may be of the greatest assistance in the campaign to control syphilis by urging the families of such cases and persons with whom the patients have come in intimate contact to undergo a medical examination. Because cases of late syphilis usually are considered to be only slightly infectious, if at all, the fact is forgotten that they must have passed through one or more infectious stages to reach the condition in which they are found and that during this infectious period they probably have transmitted the disease to persons with whom they have come in contact.

TREATMENT OF SYPHILIS.

The treatment of syphilis always includes both arsphenamine or neoarsphenamine and mercury; the iodides are of value particularly in the later stages, but many physicians are now using them early in the course of the disease. As soon as the disease has been diagnosed definitely as syphilis, but never before this time, vigorous treatment should be begun. Except under unusual conditions, the initial treatment includes at least 16 doses of arsphenamine and a proportionate number of mercury injections or inunctions. The frequency of administration, the amount of drugs to be used, and the number of courses needed to cure can be determined only by the physician administering the treatment, because the treatment varies with the condition of the patient and the stage of the disease.

It is essential that social workers warn patients with whom they come in contact to abstain from drinking alcoholic beverages immediately before or after treatment with arsphenamine. Patients should be taught to appear for arsphenamine injections with an empty

stomach and not to eat again for at least three hours after the injection. When patients follow these rules one of the frequent causes of reactions from this drug is removed.

The person who is suspected of being infected with syphilis should be warned that the early stages are the most infectious and that the danger of infection is very great until at least two weeks of vigorous treatment has been administered. The patient should be warned that during its early stages the disease may be spread not only through sexual intercourse but also through contact with the secretions from the mouth and skin. As long as the suspicion lasts, or until the physician advises that sufficient treatment has been given to render that disease practically noninfectious, the patient should refrain from kissing other persons, from coming into intimate contact with them, and from using toilet articles, eating utensils, or the like, which are used by other persons.

The successful treatment of syphilis requires a minimum of two or more thorough courses with arsphenamine and mercury, with a rest period of a month or two between these courses of treatment. After the symptoms have disappeared, it is difficult to persuade the patient that further treatment is necessary. Here the social worker who comes in intimate contact with the patient and his family can be of great assistance; for such a person must be convinced of the necessity for sufficient treatment. Syphilis is essentially a recurrent disease. If insufficient treatment is given, the number of cases are negligible in which the disease does not recur, frequently with increased virulence.

Gonorrhea.

To gain a comprehensive idea of the diagnosis and treatment of gonorrhea, it is necessary to consider the disease in both the male and the female.

DIAGNOSIS OF GONORRHEA IN THE MALE.

When an acute discharge of pus occurs in the male urethra, the inflammation is caused most frequently by the gonococcus; but since other agents occasionally produce this condition, a microscopic examination of a smear from the discharge is made in the physician's office or at a neighboring laboratory. If this smear shows the presence of the characteristic coffee-bean-shaped diplococci within the pus cells as well as outside them, the picture indicates the presence of gonococci, and treatment for gonorrhea should be begun. In the later stages of the disease, or when other organisms are present, a complicated staining method may be required. In this case the smear usually is sent either to the State hygienic laboratory or to any local laboratory which is equipped for this more involved staining method.

The social worker coming in contact with a suspected case of gonorrhea should instruct the patient to appear at his doctor's office or at a free clinic, retaining his urine in order that the physician may have him pass it into two glasses; for by this test the seat of the infection usually can be determined. If the urine in the first glass is cloudy with pus and that in the second glass is clear, the infection is located in the forepart of the urethra; but when the urine in the second glass resembles that in the first, the inflammation has reached the posterior urethra, that part located within the body. If the urine is not clouded with pus but contains shreds of cast-off cells, it indicates that the disease has passed from the acute to the chronic stage.

TREATMENT OF GONORRHEA IN THE MALE.

Usually no symptoms of gonorrheal infection appear until several days after it occurs, then for two or three days a thin mucous discharge appears from the urethra. After this time the discharge may turn to a creamy yellow pus, and the disease may reach a very painful stage. During the height of the inflammation, treatment should consist of rest in bed when possible. As soon as the tenderness begins to subside, treatment with germicidal solutions may be employed. Many agents are used, and the number and frequency of application vary with the different agents. Acriflavine, one of the dye products, when administered daily is retained in the urethra for five minutes. Argyrol or protargol, silver derivatives, or permanganate of potash may be used several times daily. Only a physician experienced in the treatment can determine the strength to be used, the frequency of application, and the length of time that the treatment should be continued; but the social worker can be of great assistance in urging the patient to continue treatment until cure is complete, in warning him against quacks and self-medication, in educating him to follow directions, and in encouraging faith in the treatment which is being administered.

Proper hygiene is as essential to the cure of gonorrhea as is proper treatment. The social worker must influence the patient to abstain from drinking alcoholic beverages, from eating highly seasoned food, from indulging in sexual intercourse, and from exposing himself to exhausting experiences. The necessity for observing the rules of hygiene is impressed upon the patient by the physician, but the social worker can give more time to this educational work than can be allotted to it in a clinic or a busy office

When improperly treated (or untreated), the disease may pass into a chronic stage in about six weeks. The successful treatment of chronic gonorrhea requires both experience and skill upon the part of the physician and the constant cooperation of the social worker.

To insure success in treatment it may be necessary for the physician to locate the source of trouble by visual inspection through a urethrascope, and to treat the disease through this instrument. The cure of chronic gonorrhea may require a year or more of treatment, which sometimes may demand the services of a skilled specialist. The social worker can be of greatest assistance to the specialist in urging such patients to persist in their efforts to obtain a cure.

In testing for cure, the examination, which is made after all treatment has been stopped for a week, should reveal no discharge from either the prostate or the urethra. The urine examined in the two glasses should be clear or should contain no pus cells or gonococci. Should any germs be found, they are examined by a skilled observer, using Gram's method of staining. An irritating injection of silver nitrate is sometimes employed, and should a discharge be obtained it must show no gonococci. The complement fixation reaction and the provocative injection of vaccines are used frequently as supplementary tests of cure.

DIAGNOSIS OF GONORRHEA IN THE FEMALE.

In the early or acute stage, gonorrhea in the female usually produces an abundant discharge of pus, in which the gonococci can be found by a microscopical examination. The acute stage is of relatively short duration, and the disease soon passes into the chronic stage, when frequently it is impossible to obtain smears which show satisfactorily the presence of gonococci. If the chronic stage is suspected, the examination is made one to three days immediately after the cessation of the menstrual flow. During the previous week no treatment is given, and the patient is instructed to appear for examination without having urinated or washed the organs within six hours prior to the examination. Under these conditions it is possible for the physician to examine the organs to discover discharges and to search the various pockets in the genital organs for inflamed areas and for pus. The diagnosis of gonorrhea in women is difficult, and the public health nurse who visits an infected woman can do much to aid the physician in preparing her for examination.

TREATMENT OF GONORRHEA IN THE FEMALE.

Success in treatment requires hospital care, and only in the very early stages is there much hope for complete cure. When the disease has passed into the chronic stage it is difficult to treat and cure is rarely accomplished except after destructive operations or the climacteric. The important field of the social worker lies in inducing infected women to seek proper hospital care, for ambulatory treatment, douching, and the like are of little value.

The treatment of acute gonorrhea includes frequent cleansing of the sex organs with mild antiseptics and the use of hot sitz baths several times daily. The surface of all these organs must be swabbed carefully with an effective germicide and cleansed with sterile water. This treatment is continued for at least a week after all discharges and local signs of inflammation have disappeared and smears fail to indicate gonococci. In the chronic stage the centers of infection have to be discovered in order to apply intensive local treatment. While major surgical interference is rarely indicated in acute complications which occur during this stage, the infection may form pus pockets in the tubes which later may necessitate an operation. Infection of both tubes is a frequent cause of sterility.

Children born of women infected with gonorrhea are always in danger of blindness from an infection of the eyes, which may be prevented by the application of a germicidal solution to the eyes at birth as required by law. The infringement of this State law by midwives or others should be noted carefully by health workers and all violations should be reported. Mothers should be instructed to observe their children's eyes and to go immediately to a physician when any inflammation appears.

II. TECHNICAL NOTES ON THE DIAGNOSIS AND TREATMENT OF SYPHILIS IN THE PRIMARY AND SECONDARY STAGES.

SUPPLEMENTING "A MANUAL OF TREATMENT OF THE VENEREAL DISEASES," REVISED BY THE UNITED STATES PUBLIC HEALTH SERVICE, FOR CIVILIAN PHYSICIANS.

The diagnosis and treatment of venereal disease is covered thoroughly in "A Manual of Treatment of the Venereal Diseases," prepared originally for the use of the Medical Department of the Army, but later revised for the use of civilian physicians. The physicians in any State in which the department of health does not supply these manuals may buy them from the United States Public Health Service for 25 cents a copy.[1]

At the recent Institute on Venereal Disease Control held in Washington, D. C., the diagnosis and treatment of syphilis and gonorrhea were discussed by recognized leaders in syphilology and urology in the United States. At this meeting, methods in the treatment of syphilis, slightly at variance with the outline indicated in the manual, were brought forward, and these should be made known to the physicians who were not present. This supplement to the manual has been prepared in order to emphasize the main factors in the diagnosis and treatment of syphilis in the primary and secondary stages, and to indicate the public facilities which are available for the assistance of the physician in diagnosing and treating this disease.

[1] A copy of this manual was sent to each physician in New Jersey who indicated an interest in the subject, and upon request a copy will be sent by the Bureau of Venereal Disease Control, State Department of Health, Trenton, N. J., to any other physician.

1. Treponema pallidum.
2. Spirochaeta refringens.
3. Spirochaeta dentium.

Notes on the Diagnosis of Primary Syphilis.

Early diagnosis of syphilis is important; for the earlier the treatment is begun, the better are the prospects of cure. As the Wassermann reaction usually does not become strongly positive until the fourth week after the appearance of the chancre, a clinical diagnosis can be corroborated before that time only by a microscopic examination of the serum from the lesion or adjacent lymph nodes. In diagnosing primary syphilis, the physical characteristics of the initial lesion should not be relied upon when unsupported by laboratory evidence, because the so-called pathognomonic physical appearance of a chancre is not a reliable guide. A true chancre may be so atypical that suspicion is aroused only by the location of the sore, or it may be obscured completely in a double infection.

The dark-field examination of the chancre.—When a patient appears for diagnosis with a genital lesion or other suspicious sore, the serum expressed from it should be examined with a microscope equipped with a dark-field condenser. If an antiseptic dressing has been applied to the sore, it must be removed, the lesion irrigated with physiologic sodium chloride solution, and a wet saline dressing applied for at least 24 hours before the examination is made. If the sore has not been treated with an antiseptic, or if the antiseptic has been removed as just described, the lesion should be cleansed by rubbing it with gauze wet with saline to remove surface organisms, such as *Spirochaeta refringens*. After drying, moderate squeezing will express serum from the sore, but care should be taken not to cause bleeding. A slide should be touched to this serum, and the specimen should be protected immediately with a cover glass and examined under the oil-immersion lens of a microscope illuminated through a dark-field condenser.

The *Treponema pallidum* appears as a brilliantly white spiral, in length from one to two times the diameter of a red blood corpuscle. The spiral contains from 10 to 20 close turns, which retain their shape well while the organism moves about with both a lateral and rotary motion. If a genital chancre has been cleansed properly, there will be usually no contamination by spirochaetes which might be confused with the *pallidum*. The organism most frequently confused in this examination is *Spirochaeta refringens*, which is obviously coarser than the *pallidum*, contains fewer and less regular turns, does not retain its shape when at rest, and darts about the field rapidly and erratically. The serum from primary lesions on the lips and in the mouth is usually contaminated with *Spirochaeta dentium*, which further complicates the differential diagnosis. However, *S. dentium* is much smaller than *T. pallidum*, and the curves of the spiral are much more tightly rolled. The accompanying

plate indicates diagrammatically the differences in these three organisms.

T. pallidum found in lymph nodes.—The nature of oral lesions can best be determined by examining the serum obtained from the neighboring enlarged lymph nodes. Several failures to find *T. pallidum* in the serum of any suspicious lesion should lead to the examination of the lymph nodes in the drainage area of the sore. Frequently these lymph nodes will be found to be indurated. In this case the skin surface should be sterilized with 70 per cent alcohol or tincture of iodine, the node confined between the thumb and finger, and the needle of a small syringe inserted through the capsule. A slight motion of the needle will macerate the lymphatic tissue, from which a few drops of serum usually can be aspirated into the barrel of the syringe. If no serum can be withdrawn by this method, the syringe should be disconnected from the needle, which is left in the node, and about one-half cubic centimeter of *sterile* saline solution should be drawn into the barrel and injected into the node. After a slight manipulation of the tissue some of the fluid may be aspirated into the syringe. The fluid should be examined immediately by the dark-field method. If the lesion is of syphilitic origin, repeated examination by either or both of these methods generally will demonstrate the presence of *T. pallidum*.

As there are many cases of primary syphilis in which repeated examinations by the dark field are negative, repeated negative Wassermann reactions must be obtained before the patient is discharged. *Not less* than three Wassermann reactions should be made; the first preferably during the fourth week of presence of the sore, the second during the sixth week, and the third during the twelfth. Opportunities for observation and help in differential microscopical diagnosis are open to physicians at many of the venereal disease clinics which are equipped for this examination and are conducting the examinations frequently.

The period when both the dark field and the Wassermann may be of value.—After the third week of the existence of the chancre, *T. pallidum* tends to disappear from the primary lesion; during the third week the blood usually shows a weakly positive Wassermann reaction; after that time, as a rule, the reaction is strongly positive. As the organisms may be discovered in the serum from the infected lymph nodes, frequently for some weeks after they have disappeared from the primary lesion, we may have the benefit of a strongly positive Wassermann reaction as well as a positive dark-field examination in corroborating our clinical diagnosis.

THE BLOOD WASSERMANN REACTION.

During the past five years there has been a marked increase in the number of laboratories which perform the Wassermann reaction, so that to-day few physicians are so situated that they can not avail themselves of this indispensable service in the diagnosis and treatment of syphilis. State hygienic laboratories and many county, city, hospital, and private laboratories perform the Wassermann test. The State hygienic laboratories furnish outfits for taking blood specimens, and make the test without any charge. While the use of the blood Wassermann reaction as an adjunct to clinical diagnosis is increasing, there still are reported to departments of health a very large proportion of cases in which syphilis is diagnosed without any laboratory evidence.

The interpretation of the blood Wassermann reaction.—As the blood Wassermann reaction is indispensable as evidence of the presence or absence of syphilitic infection in most cases, and should be used in all cases except those of early primary syphilis, the value of the test must be appreciated and the interpretation understood by every physician if the test is to achieve the place which it deserves in the diagnosis of syphilis. By the third week of the existence of the chancre we begin to discover evidence, through the Wassermann reaction, of some chemical change taking place in the blood. As the disease progresses, the laboratory indicates the increase in the amount of chemical change in the blood by reporting the reaction as +, + +, + + +, or + + + +. Under this arbitrary standard, the number of plusses indicates roughly the varying degrees of change in the blood until the minimum amount of change is reached, which usually is considered pathognomonic of syphilis. This pathognomonic minimum amount of change is reported as plus 4. As the change increases beyond this point, no further measure of the increase is made, and so it is reported as plus 4 until, after proper treatment or the lapse of years, the evidence of chemical change disappears from the blood and it is reported as + + + +, + + +, + +, + or — (negative).

Sensitized and nonsensitized antigen.—As there are different standards in the amount of chemical change considered necessary to determine a doubtful reaction, many laboratories give an approximate evaluation of the Wassermann reaction which they perform, and this procedure should be adopted more generally. If the evaluation be not given, the type of antigen and method used should be stated; for in border-line cases a + + + + reaction frequently may be obtained, by the use of a cholesterinized antigen or "ice-box fixation," when only a weakly positive or negative result is obtained by the use of a less sensitive antigen such as alcoholic

extract of syphilitic liver or plain beef heart, or by the use of higher temperatures for fixation.

Thus, strongly positive results with the less sensitive antigens are practically diagnostic of syphilis, but negative results with these antigens are frequently obtained in the latent stage of syphilis, and hence may be misleading. Therefore, patients in this stage should have the benefit of the reactions with the more sensitive antigen, which would show the presence of a very slight chemical change which, if missed might be the forerunner of a recurrence of syphilis. Theoretically, while weakly positive reactions with the less sensitive antigens would seem equal to strongly positive reactions with the cholesterinized antigens, they are not of equal diagnostic value, because, in practice, it has been found that weakly positive reactions are unreliable with all types of antigens.

The "ice-box fixation" method.—The sensitivity of the Wassermann reaction is increased not only by the type of antigen used but further by the time and temperature used for the first stage of the test. Many of our progressive laboratories have adopted the "ice-box fixation" method, in which the first half of the test is performed at a low temperature for about four hours. This method increases the sensitivity of all antigens without an apparent relative increase in the number of false positives obtained. In a treated case the test for cure should include a Wassermann reaction made by this method.

As different standards exist, the same serum may be reported upon differently by different laboratories. This dissimilarity is used by some physicians to condemn the laboratory which appears to be at fault; but usually it is evidence merely of the use of different methods.

The judicious physician, instead of pitting one laboratory against another, will familiarize himself with the standards and procedure of one good laboratory, will assure himself of the proper interpretation of the reports, and generally will rely upon that one laboratory for diagnostic assistance. It is obvious that all specimens of a series of reactions used in determining the effect of treatment upon the blood of a patient should be performed by the same laboratory; for by this means only can analogous results be assured.

SUMMARY.

1. The results of the roughly quantitative test of the amount of chemical change in the blood serum caused by syphilitic infection are reported as −, +, + +, + + +, or + + + +.

2. When the change has reached a minimum considered as pathognomonic of syphilis, it is reported as plus 4. The sera of two cases, one primary and the other secondary, may both be reported as plus four, although the serum of the former may have just passed the

stage during which it would have been reported as plus three, while on the other hand the serum of the latter may have reached a stage where logically it might be reported as 16 times plus 4.

3. Interpretation of sensitive blood Wasserman reactions in:

Thoroughly treated cases.[1]	Untreated cases.
− indicates probable cure, if continually negative for two years (suggested intervals 1–2–3–4–5–6 months. The last blood should be corroborated by the spinal fluid, especially when there is a likelihood of neurosyphilis).	− practically excludes syphilis, except— (*a*) In primary syphilis (a negative is rare after the third week of the primary lesion); (*b*) In some cases of latent syphilis (a negative is rare before the third year); and (*c*) In many cases of neurosyphilis (as the blood Wasserman may be negative, the spinal fluid must be examined also).
+, ++, or +++ indicates the necessity for further treatment, but shows an approach toward cure.	+ should be interpreted as a negative in the absence of other evidence. ++ in the absence of other evidence, should be repeated many times and then should be accepted as good evidence of syphilis in only the very early or very late stages of syphilis. +++ has more weight than ++, but should be interpreted in a similar manner. (+, ++, or +++ are common in third week of primary lesion, but should be corroborated by dark field).
++++ corroborates previous diagnosis and indicates the necessity for much more treatment.	++++ constant finding in secondary syphilis; usual finding by fourth week of primary lesion; usual finding in latent syphilis. (In absence of other evidence, should not be relied upon unless repeated.)

[1] The Wassermann reaction should not be used as a guide *during* treatment, and a negative Wassermann should be disregarded in a case of syphilis known to be insufficiently treated.

Notes on the Treatment of Syphilis.

Treat the patient as well as the disease.—In stressing the importance of both arsphenamine and mercury in the chemo-therapeutic attack on the *Treponema pallidum* and the pathological formations caused by it, too frequently the physical condition of the patient and the toxic effects of the drugs upon him are forgotten. Proper hygienic treatment of the patient is necessary to stimulate his resistance and to assist the action of the drugs. The preliminary examination of the patient should include a study of all his organs and their functions so that proper hygiene can be advised and tonics administered when necessary; and throughout the treatment urinalyses and other examinations should be employed regularly to prevent any serious toxic effects from the drugs.

THE METHOD OF ADMINISTRATION OF ARSPHENAMINE, MERCURY, AND IODIDES.

ARSPHENAMINE AND NEOARSPHENAMINE COMPARED.

While there are few clinical data for the comparison of the relative merits of arsphenamine and neoarsphenamine, many of the recognized leaders in syphilology insist that arsphenamine should be used

wherever the facilities for its administration exist, because they find that the administration of neoarsphenamine may result in dangerous reactions. The statement that 9 decigrams of neoarsphenamine are the therapeutic equivalent of 6 decigrams of arsphenamine is doubted by many syphilologists; and at least one manufacturer of the two drugs advises the administration of neoarsphenamine in double the dosage used for arsphenamine.

I. ARSPHENAMINE.

The preparation of arsphenamine solution and its injection.—Before preparing arsphenamine solutions the sheet of instructions accompanying each ampul should be read carefully in its entirety, because of the variation in different products. However, there are certain precautions which must be observed regardless of the product used.

(*a*) *The gravity apparatus and its sterilization.*—While there are many types of apparatus used for the injection of arsphenamine, the Luer-Kaufman is one of the simplest and most inexpensive. The one essential part is a special form of 2 cubic centimeter all-glass syringe, which acts merely as a valve between a Luer needle and the rubber tubing which is attached to the arsphenamine container. The entire apparatus must be boiled for about 15 minutes before using, and then rinsed with sterile distilled water. If the apparatus is not rinsed, there is danger that the concentration of the salts in the water in which the apparatus is boiled may leave a deposit of salt, which, by its contact with the arsphenamine solution, may produce reactions. When new rubber tubing is used, it must be boiled for about half an hour and the rubber stretched during the boiling process to eliminate the sulphur. Of course, the rinsing of new tubing should be thorough. The ampul containing the arsphenamine should be soaked for a few minutes in alcohol to insure sterility and to test for minute cracks in the glass.

(*b*) *Each decigram of arsphenamine dissolved in 30 cubic centimeters of water.*—Arsphenamine should be diluted with not less than 30 cubic centimeters of sterile, freshly distilled water for each decigram of the product; the temperature of the water to be used is stated by the manufacturer. While the arsphenamine should dissolve readily in this amount of water, the container may be rocked to hasten the solution; but agitation should be avoided.

(*c*) *The hyperalkalinization of arsphenamine.*—Arsphenamine gives an acid reaction to its solution and is very toxic in this form, so that it must be hyperalkalinized before injection. The inconvenience of titration has caused many physicians to give up the use of arsphenamine or to substitute neoarsphenamine, but the titration may be performed more satisfactorily when normal NaOH (approximately 4 per cent) solution is used (instead of the more concentrated solution formerly recommended) and measured from a burette or pipette. A

sufficient quantity is added to the acid arsphenamine solution to redissolve the precipitate first formed; then to this neutral solution one-fifth of the amount already used for neutralization should be added to insure hyperalkalinization.

(*d*) *The injection of arsphenamine.*—The hyperalkalinized arsphenamine solution should be filtered through sterile gauze into the container, and if clear, the solution is ready for injection. The patient should lie on the table with the arm, neck, and side of chest exposed. Rubber tubing or an Esmerch bandage tightened about the upper arm will usually distend the veins sufficiently to make veni-puncture easy, but, if necessary, the opening and closing of the hand will aid in distending the veins. The site of the injection should be sterilized with 70 per cent alcohol; the skin should be drawn down and held down with the left hand while the needle is inserted into the vein with the knuckles of the right hand pressed firmly against the skin of the arm.

(*e*) *The needle point.*—Platinum needles are preferable to steel needles because they do not rust or corrode. The needle, which should be not larger than 22 gauge, should be sharp, for a dull point causes pain and tears the wall of the vein. Stokes [2] points out that if the point of the needle is too long, the needle may enter the vein sufficiently far to allow a flow of blood, yet enough of the opening may be outside the vein wall to permit of considerable infiltration of the surrounding tissues; or the point may penetrate beyond the vein and allow leakage in the same manner, in which case there will be pain but no bulging if the infiltration is slight. A point ground too short can not be sharp enough to penetrate the vein wall easily.

(*f*) *Allow two minutes for the injection of each decigram.*—When the needle has entered the vein satisfactorily it should not be moved during the period of administration. As an additional precaution against any slipping of the needle, a small piece of adhesive plaster is sometimes used to anchor the needle or syringe to the skin. The container should be elevated only sufficiently high to force a slow injection of the arsphenamine solution. At least two minutes should be consumed in injecting each decigram of arsphenamine; if the injection is proceeding too rapidly the container should be lowered; if too slowly, it may be raised.

2. NEOARSPHENAMINE.

Neoarsphenamine does not require alkalinization after solution. The greater simplicity of this injection as compared with that of arsphenamine accounts in a large measure for the popularity of this product. The gravity method of injection for neoarsphenamine is urged by most manufacturers; but the use of a syringe in injecting the product is more common under the conditions which prevail in

[2] Technical Refinements and Methods of Intravenous Injections.

most free clinics, for the time and effort conserved more than balance the danger of too rapid injection if the following precautions are observed:

(*a*) *Sterilization of syringe.*—The syringe should be boiled in distilled water, or if tap water is used, it should then be rinsed in sterile distilled water. The ampul containing neoarsphenamine should be soaked in alcohol for a few minutes to test for minute cracks in the glass and to insure sterility.

(*b*) *Preparation and injection of neoarsphenamine.*—The neoarsphenamine is best dissolved by being sprinkled on sterile water, allowed to settle, and the cylinder or flask being turned once or twice to obtain a clear solution. The solution should be filtered through a little plug of gauze stuffed part way into the stem of a funnel or thistle tube. This filtration will remove cotton, glass, or undissolved particles of neoarsphenamine which might cause embolism. Use only a recently manufactured product, without abnormal color, odor, or insolubility, and contained in a perfect package.

(*c*) *Dilution.*—Not less than 10 (preferably 20) cubic centimeters of sterile distilled water should be used for dissolving each dose of neoarsphenamine (2 c. c. for each 0.1 gm.); greater dilutions reduce the danger of reactions; lesser dilutions may be used, but they increase the danger of reactions because of the difficulty of making a slow injection with a small quantity of fluid.

(*d*) The suggestions (*d*) and (*e*) on page 865, relating to the injection of arsphenamine, apply equally to the injection of neoarsphenamine. The tourniquet must be applied, the area sterilized, and the properly sharpened needle introduced into the vein; the blood must flow freely to assure the operator that the vein has been entered properly; then the neoarsphenamine solution should be injected slowly without undue pressure.

(*e*) *Time required for injection.*—At least two minutes should be consumed in injecting each 30 cubic centimeters of solution; the temptation to hasten the injection is so great that the operation should be timed with a watch. The use of a small caliber needle, 22-gauge, is urged to help insure slowness of injection.

SAFEGUARDS TO PREVENT REACTION.

A. The patient.—(*a*) Antisyphilitic treatment should not be begun until a thorough examination of the patient has been made; the examination should include the usual tests on all the organs of the body.

(*b*) Patients who are suffering from an acute involvement of the heart, the nervous or the sensory organs, should not receive arsphenamine medication until a period of mercury treatment has prepared the patient's system for arsphenamine.

(*c*) Patients whose livers have become involved, who are febrile, or who are suffering from urinary retention or cancer should not

receive full doses of arsphenamine except after the most serious consideration. Stokes advises the treatment of the cancer first; syphilis after.

(*d*) In patients who have exhibited a hypersensitivity to arsphenamine, reactions may be prevented by giving one-fiftieth grain of atropin intravenously an hour before the injection. Atropin prevents reaction probably by stimulating adrenal activity. It is wise to have a sterile syringe always on hand with adrenaline solution to be injected intravenously should reactions occur.

(*e*) The Herxheimer reaction is caused probably by the liberation of endotoxins from the destroyed Treponemata in amounts too great to be borne by the body. Usually this reaction may be prevented by a preliminary administration of mercury, which, because of its slower action, does not cause such a rapid liberation of endotoxins.

B. The administration of the drug.—(*a*) Every precaution should be observed to insure aseptic conditions. Sterilize the ampul with alcohol; boil and rinse the instruments; follow the manufacturer's directions carefully in making the solutions; guard against infiltrations and against haste in injecting, but do not allow the solution to stand an undue length of time.

(*b*) No meal should be eaten by the patient during the six hours prior to the injection, nor for three hours afterwards; but a cup of tea or coffee with a piece of toast may be taken three hours before the injection. Cathartics should be given the night before the injection and the patient urged to drink large amounts of water.

Prophylactic use of arsphenamine.—Arsphenamine alone can not be relied upon for the cure of syphilis, but it may be used as a prophylactic for a person exposed to syphilis who reports too late to be benefited by early local treatment. Clinical records show that a limited number of persons treated with two half-doses of arsphenamine after the first day of exposure and before the primary symptoms have had time to appear have never developed symptoms of syphilis. The difficulty of obtaining positive proof of the absolute value of this procedure is apparent; but it seems to be well established by negative proof that the use of two such injections is warranted.

3. OTHER ARSENICAL COMPOUNDS.

(*a*) *Substitutes for arsphenamine are ineffective.*—There are many trivalent arsenical compounds and some preparations which are merely physical mixtures of the common arsenicals or mercury salts with other drugs, for which extravagant claims are made, but which have little therapeutic value in comparison with arsphenamine. These drugs, some inefficient and others dangerous, sold under such trade names as Monarson, Arrhenal, Arsenoven, Atoxyl, or Soamin and Arsacetin, have been condemned by the American Medical Association and the United States Public Health Service. Those which are not dangerous probably have not the therapeutic value of the stand-

ard preparations, arsphenamine and neoarsphenamine, the manufacture of which is under the inspection and license of the United States Public Health Service. Since both arsphenamine and neoarsphenamine in a safe form, properly tested, can be obtained throughout the country, there is no excuse for the use in the routine treatment of syphilis of any product not passed by the Council on Pharmacy of the American Medical Association.

4. MERCURY.

Administered either by inunction or injection, mercury has a slower action than arsphenamine, but for this reason its use is indicated in those conditions where the administration of arsphenamine might cause a Herxheimer reaction and might affect unfavorably acute involvement of the heart, nervous system, or sense organs. Mercury is carried in the blood as an albuminate and is eliminated very slowly, so that, if it is administered carelessly, it may accumulate and give rise to serious toxic manifestations. This danger varies with the different methods of administration, which must be considered separately.

A. Mercurial inunctions.—Mercury is better tolerated when administered as an inunction than it is in any other form, but the use of mercury by inunction is limited by the difficulty of obtaining the patient's cooperation in applying the inunctions properly. Only exceptional patients can be relied upon to rub themselves properly, and as the process is dirty and disagreeable, the physician must have a considerable influence upon his patient to insure proper application.

Mercurial inunctions should be administered in a larger dose than is commonly employed by physicians. From 4 to 8 grams of 33 per cent mercurial ointment should be rubbed in every day for 6 days, and followed by a day of rest, during which a bath should be taken. From 40 to 80 inunctions should constitute a course, and a total of about 300 inunctions should be administered during the entire treatment. Several sites on the body, free from hair, should be chosen so that the mercury is not applied to the same area repeatedly. The areas best suited for inunctions are the sides of the back and abdomen and the inner sides of the thighs. Patients should be instructed to rub the ointment in for at least 15 minutes while in a warm room, but cautioned not to rub too vigorously. If the limit of toleration has been reached, further absorption may be prevented by giving two hot baths and a sweat.

B. Mercurial injections.—Either the soluble or the insoluble salts may be used in injections of mercury. The soluble salts are used and recommended by many eminent syphilologists; but in practice, the majority of physicians [3] are using the insoluble form probably because its use requires only one visit each week to the physician's office.

[3] The replies to questionnaires addressed to the physicians of New Jersey show that 60 per cent of those replying use injections of salicylate.

Soluble and insoluble mercury salts compared.—The soluble preparations are preferable because their action is more rapid and is more easily controlled, and because they do not cause abscesses or embolism. The advantage of the insoluble salt, i. e., the infrequency of the visits required for its administration, should not outweigh the obvious advantages of the soluble form in so serious a disease as syphilis.

(*a*) Of the soluble salts—

(1) The bichloride is used most frequently.[4]

(2) The succinimide, the benzoate, the oxycyanide, and other salts are substituted by a few [4] physicians with the intention of causing less pain to the patient.

The soluble salts should be administered at least three times each week in 0.016 gram (¼ grain) doses. The intravenous injection of soluble salts is believed by Stokes to be dangerous; they should be injected intramusculary as are the insoluble forms.

(*b*) Of the insoluble salts—

(1) The salicylate in oil is the most satisfactory form and one most frequently administered.[4]

(2) Calomel is not absorbed quite so rapidly or regularly as the salicylate, but is used by few [4] physicians.

(3) "Gray oil" is substituted for the salicylate by only a very few physicians.[4] As it is absorbed irregularly and sometimes not for months, most syphilographers advise against its use.

The medium in which the insoluble mercury is suspended should consist of at least 9 parts of a vegetable oil to 1 part of mineral oil. The insoluble salts are usually administered once every 7 days, in 0.064 gram (1 to 1½ grain) doses. Irvine recommends a smaller dosage biweekly.

The effects of overdosage and how to prevent the toxic effects of mercury.—Since mercury is a poison only slightly less toxic to the human body than to the Treponemata, a dosage sufficiently large to be effective in the cure of syphilis may produce toxic effects in the body. The toxic effects are indicated most frequently by—

(1) Renal Complications: Stokes advises the making of a weekly urinalysis during the entire period of mercury administration and the inclusion of a microscopical examination for casts and blood. When kidney irritation is discovered, treatment with mercury should be suspended or reduced until the urine is free from the casts or cells. After this time the dosage should be increased cautiously.

(2) Salivation: Salivation should not be used as a guide for overdosage. The manifestations may be stopped by—

(*a*) The use of an alkaline tooth paste containing $KClO_3$ (potassium chlorate);

(*b*) Painting the gums with an astringent; and

(*c*) Gargling the throat.

[4] All statements are based upon the replies to a questionnaire which was answered by one-third of the physicians of the State of New Jersey.

Slight discomfort felt when the teeth are clenched is not a danger signal and may be prevented by excluding acid fruits and vinegar from the diet.

(3) Gastrointestinal Complications: Gastrointestinal irritation may be controlled by—

(*a*) Regulating the diet to exclude foods with a high fiber content; and

(*b*) By prescribing bismuth, charcoal, or paregoric when indicated.

Method of injecting mercury.—The technique of intramuscular injection is described by Stokes as follows: The position of the patient has much to do with the ease of injection. The patient should lie face downward on the table, the arms hanging over the sides, the buttocks exposed, the legs extended with the toes turned in and heels out. This position relaxes the gluteal muscles. The upper, outer quadrants of the buttocks should be selected as the sites for the injections. The site should be washed with soap and water and rubbed with 70 per cent alcohol. The Luer syringe should be equipped with needles varying in length from 1 inch to 2½ inches, and preferably 22 gauge. It is important that the length of the needle be suitable to the type of buttocks presented by the patient, that it be of small diameter, and that it be sharp. With proper equipment and skillful technique, the pain of injection may be greatly diminished; but with needles too large and dull, the patient learns to dread the injection.

Stokes advises against the use of an empty needle. The syringe is filled with the mercury salt, the buttock is pulled down with the left hand and held firmly, and the needle is introduced quickly at an angle of 45°. If the needle is of the proper length, the point will lodge in the facia of the muscle rather than in the muscular tissue. If this is accomplished, the mercury salt spreads over the facia, is absorbed more easily, and does not produce nodules. After the needle is introduced, the syringe is aspirated lightly and a minute is allowed to give the blood an opportunity to appear in the syringe in case a vein is punctured. If blood does not appear, the mercury salt may be injected, but the injection should be given slowly. If blood *does appear*, the needle should be removed, the syringe refilled, and a new puncture made. It is not wise to attempt to jab the needle about hoping thereby to escape the vein which was punctured. When the injection is completed and the needle withdrawn, the release of the buttock prevents the escape of the salt.

5. THE IODIDES.

While the potassium salt is most commonly employed, the iodide of sodium is less depressing but no less efficacious. The iodides are believed to have some resolving action upon gummata and other overgrowths of connective tissue; the hypothesis is that the iodine

neutralizes the agents which prevent the absorption of the diseased tissues. It may be necessary to omit the use of iodides in cases of tuberculosis.

While overdosage should be avoided, from 3 to 10 grams (approximately 50 to 150 grains) may be administered daily, if given after meals, with large quantities of water. On account of the occasional production of edema of the glottis, the initial dosage in 24 hours should not exceed 1 gram (15 grains).

Although the value of the iodides in the early stages of syphilis was not argued at the Institute at Washington, there are many references in the present-day literature urging their use in conjunction with the spirillicides in all stages of the disease, and therefore the iodides are included in the schedules of treatment which follow.

THE TREATMENT OF SYPHILIS IN THE EARLY PRIMARY STAGE.

If antisyphilitic treatment can be commenced soon after the appearance of the chancre and *before* the blood Wassermann becomes positive, it is possible, frequently, by the intensive administration of both arsphenamine and mercury in the maximum doses which can be administered without injuring the patient, to effect a cure in one year; but all cases must be followed up for at least two more years to watch for possible recurrences.

A study of the replies to a questionnaire on the treatment of syphilis shows that the majority of the physicians of New Jersey, who are administering arsphenamine and mercury in the treatment of early primary syphilis, are giving two or three courses, each consisting of from 4 to 8 injections of arsphenamine or neoarsphenamine and from 12 to 24 injections of a soluble salt. Few of the physicians answering the questionnaire rely on the injections of only a few large doses of arsphenamine to effect an abortive cure.

The minimum amount of drugs for the treatment of early primary syphilis recommended by the Bureau of Venereal Disease Control of the State of New Jersey is indicated in the following table:

Drug.	Injections.	Total grams.
Arsphenamine	16	7-13
or		
Neoarsphenamine	16	10-15
Mercury (soluble)	147	2.4 (37 grains)
or		
Mercury (insoluble)	49	3.0 (49 grains)

At times it may be necessary to discontinue the administration of one or another drug and to break in with additional rest periods because of the patient's condition or intercurrent illness. Therefore, while no hard and fast schedule can be prepared to be followed blindly, a typical schedule of the necessary minimum of treatment is presented in Table I for convenient reference in the treatment of cases presenting no unusual feature.

TABLE I.—*Primary syphilis: Blood Wassermann negative—Typical course of treatment for average sized adult male.*

Course.	Period during which indicated treatment is administered.	Weekly dosage of arsenic.	Weekly dosage of mercury.	Weekly dosage of iodides.	Tests.
First course.	First week.	3 injections of arsphenamine, dosage, 0.2 to 0.6 gm. as indicated; or 3 injections of neoarsphenamine, dosage, 0.3 to 0.9 gm. as indicated. First dose, one-third regular dosage; second dose, two-thirds (approximate).	Omit.	Omit.	Dark-field examination of lesion. Positive finding before beginning treatment.
	Second to sixth week (inclusive).	1 injection of arsphenamine, dosage, 0.4 to 0.6 gm.; or 1 injection of neoarsphenamine, dosage, 0.6 to 0.9 gm.	Beginning after fourth injection of the arsenical: 6 inunctions, 4 to 8 gm., or 1 insoluble salt, 0.064 gm. (1 gr.), or 3 soluble salt, 0.16 gm. (¼ gr.) (1.6 c. c. of a 1 per cent solution).	Sodium or potassium iodide by mouth, 1 gm. or more daily (increasing in rare cases even as high as 10 gm.), given intermittently over 2-week periods with two weeks' rest.	Microscopical examination for erythrocytes and for casts.[1]
	Seventh to eighteenth week.	Omit.	Same as above.	Same as above.	Same as above.
	Nineteenth to twenty-second week.	Omit.	Omit.	Omit.	At end of month blood Wassermann can be taken, but treatment must be continued if negative.
Second course.	Twenty-third to thirtieth week.	1 injection of arsphenamine, dosage, 0.4 to 0.6 gm. as indicated; or 1 injection of neoarsphenamine, dosage, 0.6 to 0.9 gm. as indicated.	6 inunctions, 4 to 8 gm., or or 1 insoluble salt, 0.064 gm. (1 gr.), or 3 soluble salt, 0.016 gm. (¼ gr.), (1.6 c. c. of a 1 per cent solution).	Sodium or potassium iodide by mouth, 1 gm. or more daily (increasing in rare cases even as high as 10 gm.), given intermittently over 2-week periods with two weeks' rest.	Microscopical examination of urine for erythrocytes and for casts.[1]
	Thirty-first to forty-eighth week.	Omit.	Same as above.	Same as above.	Same as above.
	Forty-ninth to fifty-second week.	Omit.	Omit.	Omit.	Blood Wassermann after 1 month without treatment. If negative, repeat at 1-2-3-4-5-6 month intervals.

[1] If the urine is not watched carefully, mercury should not be administered during the entire course of arsphenamine. Therefore, if for economic reasons the physician can not require a weekly urinalysis, mercurial treatment should be delayed until half the arsphenamine course has been given.

NOTE.—If blood Wassermann becomes positive, treat as latent syphilis.

THE TREATMENT OF SYPHILIS IN THE LATE PRIMARY AND SECONDARY STAGES.

After syphilis has progressed to the stage in which the blood Wassermann is positive (as it is before the secondary rash appears) the disease does not respond so well to intensive treatment, and it may be better sometimes to withhold such intensive treatment until the body has been prepared for it with preliminary injections of mercury. If no symptoms, such as headache or neurological signs, develop, the intensive treatment with arsphenamine should be begun on the eighth day with half dose, after treatment with iodides and injections of mercury (as indicated in the next table), followed with full doses of arsphenamine and mercury.

The typical schedule of treatment for late primary and secondary syphilis presented in Table II is prepared only as a convenient reference for uncomplicated cases. As in the treatment of early primary syphilis, no hard and fast schedule is possible. It is well to note that in the latter stages of syphilis the urinary examination is of increased importance, for frequently such cases do not tolerate mercury so well as do patients in whom treatment is begun earlier.

TABLE II.—*Late primary or secondary syphilis: Blood Wassermann positive—Typical courses of treatment for average-sized adult male.*

Course.	Period during which indicated treatment is administered.	Weekly dosage of arsenic.	Weekly dosage of mercury.	Weekly dosage of iodides.	Tests.
First course.	First week.	Omit.	6 inunctions, 4 to 8 gm.; or 1 insoluble salt, 0.064 gm. (1 gr.); or 3 soluble salt, 0.016 gm. (¼ gr.).	Omit.	Microscopical examination of urine, for erythrocytes and for casts.
	Second week.	2 injections of arsphenamine, dosage, 0.1 to 0.6 as indicated; or 2 injections of neoarsphenamine, dosage, 0.6 to 0.9 gm. as indicated (first dose half regular dosage).	Omit.	Omit.	Same as above.[1]
	Third to eighth week, inclusive.	1 injection of arsphenamine, dosage, 0.1 to 0.6 gm. as indicated; or 1 injection of neoarsphenamine, dosage, 0.6 to 0.9 gm. as indicated.	6 inunctions, 4 to 8 gm.; or 1 insoluble salt, 0.064 gm. (1 gr.); or 3 soluble salt, 0.016 gm. (¼ gr.).	Sodium or potassium iodide by mouth, 1 gm. or more daily (increasing in rare cases even as high as 10 gm.), given intermittently over two-week periods with two weeks' rest.	Same as above.[1]
	Ninth to twenty-sixth week.	Omit.	Same as above.	Same as above.	Same as above.
	Twenty-seventh to thirtieth week.	Omit.	Omit.	Omit.	Blood Wassermann can be taken, but treatment must be continued even if negative.

Second course.	Thirty-first to thirty-eighth week.	1 injection of arsphenamine, dosage, 0.4 to 0.6 gm. as indicated; or 1 injection of necarsphenamine, dosage, 0.6 to 0.9 gm. as indicated.	6 inunctions, 4 to 8 gm.: or 1 insoluble salt, 0.061 gm. (1 gr.); or 3 soluble salt, 0.016 gm. (¼ gr.).	Sodium or potassium iodide by mouth, 1 gm. or more daily (increasing in rare cases even as high as 10 gm.), given intermittently over two-week periods with two weeks' rest.	Microscopical examination of urine, for erythrocytes and for casts.[1]
	Thirty-ninth to sixty-second week.	Omit.	Same as above.	Same as above.	Same as above. Blood Wassermann after two months without treatment; if negative, give one more course; if positive, at least two courses.
Third course.		Repeat second course.	Repeat second course, increasing the length of rest period.		
Fourth course.		Repeat second course.	Same as above in case of positive Wassermann at end of second course; if negative, omit but continue tests.		

[1] If the urine is not watched carefully, mercury should not be administered during the entire course of arsphenamine. Therefore, if for economic reasons the physician can not require a weekly urinalysis, mercurial treatment should be delayed until half the arsphenamine course has been given.

NOTE.—If blood Wassermann remains positive, treat as latent syphilis; if negative, repeat test at suggested intervals. If the Wassermann becomes positive later, treat as latent syphilis.

THE TREATMENT OF LATENT OR TERTIARY SYPHILIS.

The treatment of syphilis in the latent and tertiary stages is more a private medical problem than a public health problem, for only in the early stages is the disease highly infectious. While infectiousness is demonstrable in latent, tertiary, or "para-syphilis," it must be disregarded because of the economic limitations of the present-day program for the control of the disease. If all cases of syphilis in the earlier or florid stages could be treated adequately, the problem of control could be solved; and this properly may be the aim of our efforts. On the other hand, the discussion of the many details of the treatment of such affections as nervous, vascular, or heriditary syphilis can not be covered adequately in a short series of notes.

HYPOCHLORITE PROCESS OF OYSTER PURIFICATION.

REPORT ON EXPERIMENTAL PURIFICATION OF POLLUTED OYSTERS, ON A COMMERCIAL SCALE, BY FLOATING THEM IN SEA WATER TREATED WITH HYPOCHLORITE OF CALCIUM.

By F. A. Carmelia, Passed Assistant Surgeon, United States Pubic Health Service.

Introduction.

Raritan Bay is one of the important oyster-producing areas of the country, and, owing to its proximity to New York City and contiguous urban centers, it became, with the growth of those communities, increasingly more desirable from a commercial standpoint and less desirable from the public health standpoint.

Recently, as shown by the *B. coli* content, the sewage pollution present in the waters and shellfish of the Raritan Bay area was reported generally to have reached the permissible limit from the public health standpoint, and in considerable areas it had exceeded such limits. The problem of what to do with the bay as a shellfish-producing area was becoming increasingly urgent, as it was not believed practicable to cause the abandonment of the area for shellfish culture.

To the already urgent problem was added the belief that the completion of the Passaic Valley sewerage project, adding about 300 million gallons of sewage per day to the waters of New York Bay, would make imperative the adoption of further safeguards to protect public health from the possibility of contracting infectious disease through the marketing of shellfish from this area.

The Passaic Valley sewerage project is a collecting trunk sewer serving several large congested urban populations in the Passaic River Valley, discharging through multiple dispersion outlets into the waters of Upper New York Bay along the westerly edge of the ship

channel opposite Robbins Reef and about 2 miles above the Narrows leading direct to the waters of Lower New York Bay, which include Raritan Bay. Owing to the length of the sewer trunk (several miles), the sewage would be discharged in a fine state of subdivision, tending toward a maximum area of diffusion in those tidal waters.

Accordingly, the health authorities concerned issued notice that direct marketing of shellfish from the waters of Raritan Bay would probably have to be prohibited in order to safeguard public health, unless such shellfish were subjected to some acceptable method of purification. This notice focused interest upon available methods of oyster purification. Of the two methods known, that of purifying polluted oysters by means of floating them in natural waters of acceptable freedom from sewage contamination was impracticable because there were no such natural waters in that area. There remained, therefore, but to consider the feasibility of purifying polluted oysters on a commercial scale by floating them in natural waters rendered safe through treatment with hypochlorite of calcium.

Oystermen in the area had learned of the possibility of oyster purification by the hypochlorite method demonstrated by the United States Public Health Service in the contiguous area, Jamaica Bay, in 1916. They met and selected a committee to seek aid from the State Conservation Commission of New York.

The State Conservation Commission arranged to conduct a series of demonstrations on a commercial scale, selecting Great Kills Harbor, a small harbor on Raritan Bay, as the site. The Department of Health of the city of New York, the Bureau of Chemistry of the United States Department of Agriculture, and the United States Public Health Service were duly invited to make observations covering the acceptability of the process from the public health standpoint.

Personnel.

Commissioner George D. Pratt, of the State Conservation Commission, designated Sanitary Chemist William F. Wells, formerly of the Public Health Service, to conduct the demonstration; the Bureau of Chemistry designated Dr. Payn Parsons to make observations on the acceptability of the process; and the writer was detailed by the Public Health Service to cooperate with Dr. Parsons in making the observations. The State Department of Health of New York did not make observations of the series of demonstrations; a representative was present at one special demonstration but took no samples of the oysters. The New York City Department of Health secured samples of the treated oysters upon marketing and were represented at but two of the series of demonstrations.

The Site.

Great Kills Harbor is a shallow, landlocked body of water about one-half mile in width and 2 miles in length, having a narrow entrance from Raritan Bay. The tidal replacement of its waters is estimated to be 66 to 75 per cent of total high-water volume. There was moderate pollution along the foreshores and from about a score of small pleasure yachts anchored in the harbor. The harbor water at low tide was, on the average, positive for *B. coli* in amounts of 1 c. c. (sometimes in three-tenths c. c.), and at high water it was positive in amounts of 3 c. c. (frequently in 1 c. c.). There was a moderate degree of turbidity present which was mostly due to suspended organic matter. Wind was of little import in the water pollution, as was also tidal flow, locally.

Experimental Equipment.

Two tight oyster floats of scow type, 50 feet by 9 feet by 2 feet 6 inches, were moored out in the upper center portion of the harbor, which was less frequented by boats and distant from sources of shore pollution. The mean low-water depth was 4 feet, and the tidal range varied from 5 to 6 feet. The harbor bottom was soft mud, 18 inches to 3 feet in depth. Each scow had 4 bungholes, 2½ inches in diameter, stopped with wooden plugs. One scow was equipped with a small gas engine and a rotary pump, piped to fill with and discharge sea water and also to circulate water within the hold. It could not be made to operate satisfactorily, and so in both scows filling was accomplished through temporary removal of the plugs, and the water was discharged with pails and hand pumps. In such scows containing water for floating, 60 to 75 bushels of oysters can be handled.

A supply of 12-ounce containers of commercial hypochlorite of calcium, a pestle and a mortar for pulverizing and mixing the hypochlorite, a pair of ordinary 6-foot rowing oars, and a glass container for testing satisfactory diffusions of the hypochlorite in the floating water by means of a one-tenth of 1 per cent solution of orthotoluidine in 10 per cent hydrochloric acid completed the equipment used, in addition to the ordinary oyster-dredging equipment.

The laboratory control of the process was conducted by Dr. Parsons, who used the laboratory of the eastern division of the Bureau of Chemistry in New York City, and by the writer, who availed himself of the laboratory facilities of the United States marine hospital at Stapleton, N. Y., about 8 miles from Great Kills. The standard methods of the American Public Health Association were used in the examination of the oysters.

In addition, market samples of treated oysters were examined by the New York City Department of Health.

Owing to the cost of out-of-season dredging and handling of the oyster stock for the experiment in large commercial quantities, oystermen as a group did not feel inclined to undergo experimental expense; and no other means were available for securing the oyster stock. This part of the demonstration seemed to have greatly hampered the possibilities of the experiment. Two oystermen, however, took really active interest in the project: To Mr. A. F. Merrill, of the Merrill-Haviland Oyster Co., belongs due credit, for he alone provided the essential oyster stock and necessary handling and floating equipment; and credit is also due Mr. John Schmeelks, of Jamaica Bay, for securing special lots of markedly polluted oysters made available in the series of experiments.

Conduct of the Experiment.

As it was ascertained that the tide made but slight variation in the amount of sewage pollution as evidenced by the *B. coli* content present in the waters of Great Kills, it was disregarded in conducting the experiment.

From 60 to 150 bushels of oysters were procured by the usual method of oyster dredging, from the oyster grounds of the Raritan Bay area. (A few other demonstrations were made with oysters from the most markedly polluted areas obtainable.) This dredge load of oysters was then brought in directly to the floats. Meanwhile the floats had been rendered relatively fresh and clean by being washed down with harbor water prior to placing any oysters in them. From 50 to 75 bushels of oysters were then evenly placed in the floats to a depth of 6 to 8 inches. The plugs were then pulled and the float was allowed to fill through the plug openings until several inches of water covered the top oysters, the amount of water being approximately 50 gallons to the bushel of oysters. The plugs were then securely replaced. Tight floats without leaks are essential.

A 12-ounce container of hypochlorite of calcium was then opened, and from one-third to one-half of its contents was placed in a mortar. This quantity gave from 4 to 6 parts per million of available free chlorine (assuming a 30 per cent commercial product). A sufficient quantity of water was added to the mortar to make a smooth paste, and this mixture was then quickly added, in scattered, roughly equal portions, to the water in the floats containing oysters. This was then diffused as rapidly and thoroughly as possible by means of stirring with oars. Usually 10 to 15 minutes of stirring proved sufficient.

Within from 20 to 30 minutes following the addition of the hypochlorite paste, water from various parts of the float was tested for the presence of free chlorine, using the orthotoludine test. A glassful of the treated water was taken up, and from 5 to 10 drops of one-tenth of 1 per cent solution of orthotoludine in 10 per cent hydrochloric acid

was added, which, in the presence of very small quantities of residual excess of free chlorine in the treated water, colors the water a decided straw color. The smaller the amount of residual chlorine present, the slower was the straw-colored coloration of the sample of water tested.

It is desirable to have a small residual amount of chlorine remaining in the treated water at the end of a 20-to-30-minute period. Should the test then not indicate such excess of chlorine, sufficient additional hypochlorite of calcium should be added until such excess is obtainable. There is one caution in the application of the test: Avoid taking up any small particles of unreduced hypochlorite of calcium which may occasionally be found remaining in the treated water at that stage. Such particles give a pronounced test for chlorine, which may at times erroneously indicate the desired average excess of chlorine in the treated water.

It is highly desirable that the entire step of evenly charging the water with hypochlorite of calcium be done with as little delay as possible, as the chemical is most active in the period immediately following its mixture with the water.

The amount of free and suspended organic matter present in the water to be treated directly should govern the judgment as to the amount of hypochlorite of calcium it is necessary to add to give the desired excess of chlorine at the termination of the 20-to-30-minute period. The greater the amount of organic matter present, the larger the quantity of hypochlorite indicated.

The excess of chlorine present at the termination of the 20-to-30-minute period disappears in a comparatively short time. The end products of the process consist of correspondingly small amounts of calcium carbonate and sodium chloride and are indistinguishable, both qualitatively and quantitatively, from such salts already present in comparatively large amounts in natural sea water; therefore there is no question of adulteration or otherwise changing the taste or quality of the oysters placed in such treated waters.

Following the first treatment of the water with hypochlorite, nothing further is done for a period of about 6 hours, and the oysters are allowed to remain undisturbed, which aids in their purification. At the end of 6 hours a second treatment of the water with hypochlorite, identical with the first, is then made. Following the second treatment, the treated water containing the oysters is again allowed to remain undisturbed for an additional period of from 12 to 18 hours.

At the end of this final period, totaling 18 to 24 hours from the first step in the process, the oysters are ready to be removed and marketed. It is best that their removal be accomplished with the least practicable disturbance of the water in which they have been floated. Oysters should not remain in the treated water longer than 24 to 30 hours.

Prior to the removal of the oysters from the floats at the expiration of 18 to 24 hours, it was routine to test (with the orthotoludine test) several parts of the treated water for the presence of excess of chlorine. In no instance was there found any trace of the presence of free chlorine in the water.

It is of further aid in the case of oyster stock covered with much débris and similar organic matter to wash such material off the shells in a reasonably thorough manner with ordinary clear sea water before placing such oyster stock in the floats for treatment.

Biologic Principles Involved.

The oyster, by reason of its biologic principles of growth and life, is practically a small pump with a sieve or strainer on the intake line. The flow of water set up between the shells of the oyster for the oxygenation necessary to its metabolism is, at the same time, strained of the minute organisms present therein, constituting the food supply. Any other fine particles suspended in the water, including sewage when present and bacteria, are at the same time strained out with its food supply. The material so strained passes through the alimentary canal of the oyster, being utilized as suitable for food supply, or rejected and passed through. Occasionally irritant particles are strained out of the water. These are summarily and forcibly ejected almost immediately after their entrance into the shells, without passing through the alimentary canal. Bacteria and nonfood particles entering the alimentary canal are apparently passed through and ejected practically unchanged in from four to six hours. It is estimated that about 50 gallons of water each 24 hours is passed between the shells of an oyster during the active feeding season. The amount of water so passed varies directly with the temperature of the water and oyster. Below temperatures of 40° to 45° Fahrenheit very small quantities of water are passed, barely sufficient to supply oxygenation necessary to support the dormant metabolism of the so-called hibernation stage. This explains the apparent improvement noted in oysters grown in polluted areas during such low temperatures.

Results of the Process.

The hypochlorite of calcium practically sterilizes and clears the sea water in which the oysters are placed. The water, for a brief period following the addition of the hypochlorite, is more or less irritating to the oyster, which repeatedly and forcibly rejects the water. This removes mechanically gross particles, such as mud and the like, from within the outer chamber between the shells, and for this reason the oysters when opened present a nice, clean appearance. Likewise the organic matter on the outside of the shells is loosened and more or less disintegrated and falls from the shells, leaving the ex-

ternal appearance of the oyster stock considerably improved for marketing and removing to a considerable degree the danger of contamination of the oyster meats during shucking.

With the disappearance of the excess of chemical from the water, the oyster resumes "drinking," i. e., passing water between its shells. The water is now practically sterilized and clear of suspended organic matter, and in passing through the oyster it mechanically cleans the outer and inner chambers between the shells of practically all material usually present therein. This material and the contents of the alimentary canal, having been within the oyster, were not sterilized by the first application of hypochlorite, and upon ejection into the water in which the oysters are floated, again pollute the water moderately. This necessitates the second application of hypochlorite, following which the water and oysters are both comparatively clean and sterile. The washing process incident to the oyster's drinking the treated water is then permitted to continue for the duration of the second period of from 12 to 18 hours, following which the oysters are removed for marketing.

The bacteriological results obtained by the above-described treatment of oysters showing accepted evidence of pollution are best visualized in the accompanying table, which is self-explanatory. Several samples were taken from different parts of the float, both before and after treatment, in a series of 13 runs from August 9 to September 23, 1920, and the average bacteriological results obtained in each run are tabulated.

Bacteriological results of hypochlorite process of oyster purification.

Run No.	Average B. coli score of oysters before treatment.	Average B. coli score of oysters after treatment.	Quantity of oysters treated (bushels).	Average per cent reduction of B. coli after treating.	Source of oysters.
1	23	2	46	91.3	Raritan Bay between Great Kills and Princess Bay.
2	50	5	50	90.0	Do.
3	230	23	20	90.0	Jamaica Bay, Big Channel, Canarsie.
4	14	4	60	71.4	Raritan Bay between Great Kills and Princess Bay.
5	14	4	150	71.4	Do.
6	5	3	60	40.0	Do.
7	4	2	50	50.0	Do.
8	14	5	60	64.3	Do.
9	41	4	15	90.2	Raritan Bay, off South Beach.
10	2	1	60	50.0	Raritan Bay between Great Kills and Princess Bay.
11	320	4	25	98.7	Raritan Bay, near Great Beds, Light Amboy.
12	320	3	20	99.0	Jamaica Bay, Sweetwater area near Inwood.
13	320	23	15	92.8	Jamaica Bay, Big Channel, Canarsie.

Discussion and Conclusions.

It will be noted readily that the reduction of *B. coli* following the process is more marked in oysters which were originally more heavily polluted than in those which were but moderately or slightly polluted. This experience confirms and parallels that found in the application of hypochlorite for the purification of water supplies.

In oysters scoring in the neighborhood of 50 or more, an average reduction of 90 per cent of the *B. coli* content can be confidently expected from the process.

It is apparent that an average reduction of 90 per cent in the *B. coli* score of an oyster originally scoring 500, the maximum index of pollution, will just about bring such oysters to the neighborhood of 50, the maximum score allowed for marketable oysters. Since this degree of reduction just about meets sanitary standards, and allows no leeway for a safety factor, it should not be permissible. It is believed that oysters with an original score of 230–320 represent about the maximum pollution which can be safely reduced to an acceptable score and yet provide the desired factor of safety. In other words, in dealing with oysters of known considerable pollution, the rule should be that the greater the original degree of pollution, the greater the allowance should be for a safety factor, in admitting such processed oysters to market.

In a general way, this would permit the marketing of oysters from large oyster-bearing areas now restricted to marketing during the hibernation or other restricted period fixed for such areas, during the entire season, by the use of this process during the season now prohibited.

From the public health standpoint, in an administrative way, the process should be handled in much the same manner that pasteurization of milk is controlled. The ideal plan would be the utilization of a central oyster treatment plant, preferably supervised by State or local authorities. Such a plant could be operated on a cooperative basis by the local oystermen. And, finally, the application of the process by individual oystermen in their local business has been demonstrated to be entirely feasible and desirable, if properly supervised.

Such process treatment of all oysters marketed, regardless of origin, would insure an additional safety factor to public health.

EXTRACTS FROM REFERENCES IN AVAILABLE LITERATURE PERTAINING TO SPLEEN EXAMINATIONS IN MALARIA.

In connection with the spleen examinations of school boys in Mitchell County, Ga., recently reported by Special Expert M. A. Barber and Acting Assistant Surgeon C. P. Coogle, United States Public Health Service,[1] the following review of available literature pertaining to spleen examinations in other countries has been prepared at malaria field headquarters. It is felt that the employment of spleen examinations, particularly among school children, may be a simple measure of easy application for the determination of malaria prevalence, a measure which, perhaps, has not received anywhere in the United States the attention to which it is entitled. It is hoped that through the State and local health authorities, spleen examinations of from 50,000 to 100,000 school children can be secured during 1921, in widely separated sections of the United States. These spleen examinations will be checked by other methods of determining malaria prevalence; and it is believed that a careful study of the findings will enable us to determine whether this procedure, which is so easy of application, can be employed as a satisfactory measure of malaria prevalence in the United States.

In ascertaining the prevalence of malaria in any locality, Stephens and Christophers (1904) state as follows relative to the importance of spleen examinations:

The method of determining to what extent enlargement of the spleen occurs has been largely used. Spleen enlargement due to ordinary malarial infection tends to disappear, once the individual has ceased to suffer from the disease. In very malarious countries, where each individual, after childhood, has become highly immunized, the adult population usually shows no splenic enlargement. In less malarious regions the adults have not become highly immunized, and a certain percentage of them will be found with enlarged spleens and malarial infection. The use, then, of the percentage of adults with enlarged spleens is not a reliable method of determining the real intensity of malaria.

In children the spleen enlargement appears to require a certain time to become apparent, and it takes a certain time to disappear as the malarial infection disappears with ensuing immunity. In the examination of children we find—

In the early ages, 1 to 2 years, the number infected is usually in excess of those showing splenic enlargement.

Above 2 years the spleen rate is usually somewhat in excess of the parasite rate.

Above 10 years, the spleen rate is usually considerably in excess of the parasite rate.

[1] Public Health Reports, Apr. 8, 1921, pp. 706–710.

In the use of a spleen census one should then avoid a mixed adult and child count, and children between the ages of 2 years and 10 years should be chosen.

It seems clear that the comparison of the malaria prevalence in widely different regions, by means of the percentage of enlarged spleens in the children, is not possible. It has been found, however, in some tropical regions, like Bengal, that the parasite rate and spleen rate in children vary proportionately. Here the spleen rate was always about double that of the parasite rate. (Stephens, J. W. W., and Christophers, S. R., The Practical Study of Malaria, pp. 263–4. The University Press of Liverpool, London, 1904.)

James (1920), in describing his methods of studying endemic malaria in the Tropics, relates the following as the manner of obtaining the spleen rate:

In villages in the Tropics it is seldom difficult, after the objects of the inquiry have been tactfully explained to the people, to collect a crowd of children who, by the distribution of sweets or coppers, can be persuaded to submit to clinical examination with a view to ascertaining the presence and degree of splenic enlargement. The examination should be carried out as thoroughly as circumstances permit, but it nearly always has to be made while the child is in the erect posture. The size of the spleen should be stated as being one, two, three, etc., fingers' breadth below the edge of the costal margin.

The term *splenic index* is used to denote the percentage of children between the ages of 2 and 10 years who have enlarged spleens due to malaria; however, in field work it is best not to limit the examination of children to those ages, but to examine all people who will permit it. It is often quite as important to know the adult spleen rate in a community as it is to know the rate in children. (James, S. P., Malaria at Home and Abroad, p. 96. Bale & Danielsson, London, 1920.)

Ross (1910), in his chapter on malaria in the community, gives concretely the advantages and defects of the spleen rate relative to the index in malaria. He treats of the subject as follows:

It is known that the spleen enlarges sufficiently to be detected by palpation in a considerable proportion of infected persons. Such enlargement is discoverable with certainty and in a few seconds by the fingers pressed under the ribs of the left side, and anyone—hospital assistants, nurses, and laity—can detect it. The persons to be examined are passed in a line before the examiner, while another person records the results; and with good management 100 people can be thus inspected in an hour, or else one can do the work by house to house inspection.

The method is open to the following defects:

(*a*) The enlargement may be so slight in a small proportion of cases, especially in early infections, that it may be overlooked in

them if we use palpation only. Generally, however, there is fever, or a history of recent fever, in such cases.

(*b*) The spleen of healthy infants is sometimes so easily palpable that the unskilled observer may think that it is enlarged.

(*c*) Not all infected persons show palpable spleens.

(*d*) Not all splenomegalous persons are necessarily infected. Generally speaking, however, widespread splenomegaly is due to malaria.

The advantages of the method are: (1) That the enlargement can be detected, practically with certainty and in a few seconds, by almost anyone; (2) that the method can be applied with little trouble to enormous numbers of people, thus practically avoiding the error of random sampling.

We must note that a smaller degree of splenic enlargement can be detected by percussion (as practiced by medical men) than merely by palpation. By the former method we can nearly always detect some enlargement in malaria. On the whole, we can conclude that some degree of splenic enlargement probably exists in 95 to 100 per cent of all persons infected with malaria, but that the enlargement is great enough to be palpable only in about 75 to 90 per cent of cases.

Thus, by the term *splenic index* is generally meant the percentage of persons in whom enlargement is detectable by palpation only.

In what proportion of persons with enlarged spleen are there no plasmodia at all? It is impossible to say; but we may give 20 per cent as a rough conjectural estimate.

It would thus seem that the spleen index is much nearer the truth than the parasite index, provided that the splenomegaly is really due only to the malaria.

The number of persons with parasites, but without splenomegaly, seems to be an important figure, because such cases are due to recent infections, before the spleen has had time to become enlarged—especially in children.

The average spleen enlargement depends not only on the degree of enlargement but also on the proportion of infected persons (general malaria rate), and may be looked upon as an index of the average amount of illness caused by malaria in the community. The average enlarged spleen indicates only the degree of enlargement, where it exists. Several useful deductions may be drawn from figures: Thus, numerous small enlargements would tend to indicate many recent infections; and numerous large ones with few small ones, a past epidemic.

"Generally considered, the study of the splenic enlargement, so important for public health work, has been curiously neglected in medical literature."

Ross concludes that, as a general rule, the spleen index (obtained by palpation only) is by far the best method of measurement in determining the degree of endemic malaria. It requires no great skill; it can often be applied to almost all the people in a community; and it should yield by itself a very nearly correct measure of the actual malaria rate. As a rule, local conditions, race, and complicating diseases are likely to cause a percentage of error far smaller than that due to the insufficient random sampling which must always attend the laborious estimation of the parasite index (the advocates of which frequently overlook this important point). (Ross, R., The Prevention of Malaria, pp. 220–224. John Murray, London, 1910.)

Daniels and Newham (1911), in discussing the endemic index in malaria, give the value of the splenic index in the following statement:

The spleen test, or the proportion of persons with enlarged spleens, is useful if age and race are taken into account. It is of more value amongst Negroes than amongst other races, as the Negro spleen does not continue to enlarge after immunity has been acquired, in the same way that the spleens of many individuals of other races do. The test can be used easily, as there is nothing in the examination to excite, alarm, or frighten children, and can be made more quickly than any other examination.

It indicates only antecedent, probably remote, infection, and is less certain proof of antecedent infection than the presence of parasites. A large proportion with enlarged spleens between 2 and 5 years of age is an indication of a high endemic index. If the presence of malaria in a district is proved, the absence of enlarged spleens in Negro adults or a low proportion between 10 and 15 years of age is equally a proof of high endemic index; whilst if the proportion of enlarged spleens in adult Negroes is appreciable, or large in those between 10 and 15, the endemic index is low. It is noted, however, that with no other race but the Negro can such conclusions be drawn with certainty.

The determinations obtained by the spleen test are less likely to be influenced by meteorological conditions than the test by blood examinations; they are easier to make and can be made in a larger number of cases, but otherwise are less accurate, as the conditions that lead to splenic enlargement after malarial infection vary and are not thoroughly understood, and splenic enlargement in a varying proportion is due to other causes. (Daniels, C. W., and Newham, H. B., Laboratory Studies in Tropical Medicine, 3d edition, p. 463. Bale & Danielsson, London, 1911.)

Daniels (1913) asserts that the test of the prevalence of enlarged spleen has fallen undeservedly into disuse on account of the manner in which it was at one time abused in India by the laity as well as by medical men. With the following limitations it is of considerable

value: That other diseases are also causes of enlargment of the spleen and that, therefore, where these diseases are prevalent, the value of the test is greatly reduced; that the examination should be limited to children, as in adults of other races, East Indians, etc., chronic enlargement of the spleen, whether as the result of early infection of malaria or not, persists throughout adult life, and may even increase.

With Negro races the results obtained by the spleen test are of high value. With other races, only the examinations made of children up to 15 years of age are valuable.

The advantages of the method of spleen examination are that: (1) There is less opposition to palpation of the abdomen in children than to blood examination; (2) that the examinations can be made more quickly than the examination of blood for parasites and far more quickly than differential leucocyte counts; (3) that with little training, moderately reliable results may be obtained by trustworthy men with no medical education; (4) that the condition of the spleen does not vary so rapidly as the number of parasites in the blood. Thus a spell of cold or wet weather will often result in an increase in the proportion of persons in whose blood the parasites are sufficiently numerous to be readily found, whilst the probabilities of a new infection are not affected by such meteorological changes. The size of the spleen is affected by such changes to a very slight extent. (Daniels, C. W., Tropical Medicine and Hygiene, 2d edition, pp. 83–84. Bale & Danielsson, London, 1913.)

Deaderick and Thompson (1916) state, relative to spleen rate and the endemic index, that they believe that the spleen rate would not disclose the true endemic index of regions in the southern United States. They note that elsewhere the prevalence of splenic enlargement has been employed to calculate the extent of paludism, this method requiring much less time than the examination of the blood. In their experience the spleen rate and the endemic index estimated by a microscopic examination of the blood do not usually correspond even approximately.

Quoting Stephens and Christophers, a selection of seven localities in India gave an average spleen rate of 31.46 and a corresponding parasite rate of 14.4. (Deaderick, Wm. H., and Thompson, L. T., The Endemic Diseases of the Southern States, pp. 38–39. 1916.)

DEATHS DURING WEEK ENDED APR. 9, 1921.

Summary of information received by telegraph from industrial insurance companies for week ended Apr. 9, 1921, and corresponding week, 1920. (From the "Weekly Health Index," Apr. 12, 1921, issued by the Bureau of the Census, Department of Commerce.)

	Week ended Apr. 9, 1921.	Corresponding week, 1920.
Policies in force	46,505,524	42,871,031
Number of death claims	9,592	8,878
Death claims per 1,000 policies in force	10.8	10.8

Deaths from all causes in certain large cities of the United States during the week ended Apr. 9, 1921, infant mortality, annual death rate, and comparison with corresponding week of preceding years. (From the "Weekly Health Index," Apr. 12, 1921, issued by the Bureau of the Census, Department of Commerce.)

City.	Estimated population, July 1, 1921.	Week ended Apr. 9, 1921.		Average annual death rate per 1,000.[2]	Deaths under 1 year.		Infant mortality rate week ended Apr. 9, 1921.[3]
		Total deaths.	Death rate.[1]		Week ended Apr. 9, 1921.	Previous year or years.[3]	
Akron, Ohio	[4] 208,435	39	9.8	[5] 11.7	4	[5] 7	38
Albany, N. Y.	115,071	46	20.8	C 21.5	4	C 5	90
Atlanta, Ga.	207,473	61	15.3	C 16.4	9	C 5	.....
Baltimore, Md.	751,537	223	15.5	A 19.2	30	A 36	84
Birmingham, Ala.	186,133	57	16.0	A 19.8	7	A 8	.....
Boston, Mass.	757,634	227	15.6	A 18.5	29	A 36	78
Bridgeport, Conn.	149,967	38	13.2	A 16.8	.....	A 5	.....
Buffalo, N. Y.	519,608	144	14.5	C 18.6	27	C 31	104
Cambridge, Mass.	110,444	21	9.9	A 16.5	4	A 5	72
Camden, N. J.	119,672	32	13.9	.....	5	.....	.....
Chicago, Ill.	2,780,655	625	11.7	A 16.3	95	A 142	.....
Cincinnati, Ohio.	403,418	113	14.6	C 26.0	10	C 21	66
Cleveland, Ohio.	831,138	195	12.2	C 14.4	25	C 34	67
Columbus, Ohio.	245,358	65	13.8	C 21.4	7	C 10	81
Dallas, Texas.	165,282	49	15.5	A 13.5	6	A 3	.....
Dayton, Ohio.	158,119	26	8.6	C 22.9	4	C 11	66
Denver, Colo.	263,152	82	16.2	A 15.7	10	.....	.....
Detroit, Mich.	1,070,450	227	11.1	.....	52	.....	98
Fall River, Mass.	120,668	35	15.1	C 15.2	7	C 11	105
Grand Rapids, Mich.	141,197	27	10.0	C 14.0	6	C 9	102
Houston, Tex.	144,340	41	14.8	.....	11	.....	.....
Indianapolis, Ind.	325,215	91	14.6	C 16.2	10	C 18	78
Jersey City, N. J.	302,788	102	17.6	C 23.5	16	C 22	.....
Kansas City, Kans.	103,908	27	13.5	.....	2	.....	48
Kansas City, Mo.	336,157	87	13.5	C 24.2	9	C 12	.....
Los Angeles, Calif.	611,636	174	14.8	A 13.0	13	A 10	61
Louisville, Ky.	236,083	68	15.0	C 23.2	3	C 8	35
Lowell, Mass.	113,757	31	14.2	A 17.6	8	A 8	120
Milwaukee, Wis.	468,386	107	11.9	A 13.9	29	A 30	140
Minneapolis, Minn.	392,815	97	12.9	C 22.1	9	C 24	51
Nashville, Tenn.	119,536	43	18.8	C 20.5	6	C 7	.....
New Bedford, Mass.	125,012	30	12.5	A 18.0	4	A 11	61
New Haven, Conn.	167,007	51	15.9	C 17.5	4	C 5	48
New Orleans, La.	394,657	132	17.4	A 21.3	23	A 16	.....
New York, N. Y.	5,751,867	1,440	13.1	C 20.5	224	C 231	88
Newark, N. J.	424,885	102	12.5	C 26.2	13	C 23	.....
Norfolk, Va.	121,260	24	10.3	.....	3	.....	53
Omaha, Nebr.	197,066	72	19.1	.....	9	.....	.....
Paterson, N. J.	137,463	52	19.7	.....	7	.....	.....
Philadelphia, Pa.	1,856,212	496	13.9	[5] 18.6	84	[5] 80	101
Pittsburgh, Pa.	596,413	207	18.1	C 24.9	28	C 39	99
Portland, Oreg.	254,859	58	11.4	C 11.2	4	C 11	40
Providence, R. I.	239,645	62	13.5	C 24.4	7	C 14	.....
Richmond, Va.	175,688	50	14.8	C 18.7	4	C 14	49
Rochester, N. Y.	305,229	68	11.6	C 15.5	6	C 12	47
St. Louis, Mo.	786,164	162	10.7	C 15.7	12	C 21	.....
St. Paul, Minn.	237,781	51	11.2	C 17.6	3	C 12	30
Salt Lake City, Utah.	121,595	26	11.1	A 10.8	3	.....	46
San Francisco, Calif.	520,546	184	18.4	C 15.0	10	C 8	58
Seattle, Wash.	327,227	74	11.8	A 10.1	9	A 7	75
Spokane, Wash.	104,442	28	14.0	C 13.0	4	C 4	87
Springfield, Mass.	135,877	34	13.0	.....	6	.....	90
Syracuse, N. Y.	177,265	37	10.9	C 24.1	5	C 17	60
Toledo, Ohio.	253,696	74	15.2	A 17.8	18	A 14	181
Trenton, N. J.	122,760	28	11.9	A 18.7	4	A 7	.....
Washington, D. C.	454,026	129	14.8	A 18.0	20	A 12	117
Wilmington, Del.	113,408	30	13.8	C 22.8	9	.....	.....
Worcester, Mass.	184,972	68	19.2	C 24.8	9	C 7	97
Yonkers, N. Y.	103,324	35	17.7	A 12.6	7	A 3	150
Youngstown, Ohio.	139,432	35	13.1	.....	5	.....	63

[1] Annual rate per 1,000 population.
[2] "A" indicates data for the corresponding week of the years 1913 to 1917, inclusive. "C" indicates data for the corresponding week of the year 1918.
[3] Deaths under 1 year per 1,000 births—an annual rate based on deaths under 1 year for the week and estimated births for 1920. Cities left blank are not in the registration area for births.
[4] Enumerated population Jan. 1, 1920.
[5] Data based on statistics of 1915, 1916, and 1917.

PREVALENCE OF DISEASE.

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring.

UNITED STATES.

CURRENT STATE SUMMARIES.

Telegraphic Reports for Week Ended Apr. 16, 1921.

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers.

ALABAMA.	Cases.
Chicken pox	8
Hookworm	116
Measles	9
Ophthalmia neonatorum	1
Smallpox	20
Trachoma	1
Tuberculosis	12
Typhoid fever	11

ARKANSAS.	
Chicken pox	39
Diphtheria	6
Hookworm	1
Influenza	16
Malaria	28
Measles	103
Pellagra	10
Pneumonia	2
Scarlet fever	7
Smallpox	12
Trachoma	2
Tuberculosis	17
Typhoid fever	7
Whooping cough	21

CALIFORNIA.	
Cerebrospinal meningitis:	
Berkeley	1
Los Angeles	6
San Francisco	1
Influenza	99
Lethargic encephalitis:	
San Francisco	2
Visalia	1
Smallpox	82
Typhoid fever	7

COLORADO. (Exclusive of Denver.)	
Chicken pox	33
Diphtheria	5
Lethargic encephalitis—Nunn	1
Measles	50
Scarlet fever	11
Smallpox	16
Typhoid fever	11
Whooping cough	1

CONNECTICUT.	
Cerebrospinal meningitis	1
Chicken pox	57
Conjunctivitis (infectious)	7
Diphtheria:	
Hartford	8
Scattering	28
German measles	3
Influenza	9
Lethargic encephalitis	2
Malaria	2
Measles:	
Hartford	12
New Britain	28
Norfolk	13
Waterbury	10
Scattering	53
Mumps	95
Pneumonia (lobar)	27
Scarlet fever:	
Bridgeport	22
New Haven	28
Scattering	53
Septic sore throat	2
Trachoma	1
Tuberculosis (all forms)	57
Typhoid fever	3
Whooping cough	75

DELAWARE.	
Chicken pox	7
Diphtheria	9
Measles	3
Mumps	3
Pneumonia	5
Scarlet fever	9
Tuberculosis	26
Typhoid fever	7
Whooping cough	10

FLORIDA.	Cases.
Cerebrospinal meningitis	1
Diphtheria	6
Influenza	1
Leprosy	2
Malaria	17
Pneumonia	5
Scarlet fever	1
Smallpox	48
Typhoid fever	29

GEORGIA.	
Chicken pox	19
Diphtheria	10
Dysentery (amebic)	2
Dysentery (bacillary)	13
Influenza	9
Malaria	69
Measles	54
Mumps	10
Paratyphoid fever	1
Pneumonia	9
Scarlet fever	11
Septic sore throat	4
Smallpox	56
Tuberculosis (all forms)	38
Typhoid fever	10

ILLINOIS.	
Cerebrospinal meningitis:	
Chicago	4
Marshall County—Bell Plain Township	1
Diphtheria:	
Chicago	157
Scattering	53
Influenza	26
Lethargic encephalitis—Chicago	3
Pneumonia	235
Poliomyelitis—Chicago	1
Scarlet fever:	
Chicago	142
Peoria	16
Rockford	14
Springfield	15
Scattering	126
Smallpox:	
East St. Louis	8
Niantic	14
Plainfield	35
Richland County—Decker Township	13
Rockford	11
Scattering	101
Typhoid fever	8

INDIANA.	
Diphtheria	81
Rabies—Lawrence County	1
Scarlet fever	228
Smallpox	161
Typhoid fever	16

IOWA.	
Cerebrospinal meningitis—Grinnell	1
Diphtheria	14
Scarlet fever	40
Smallpox:	
Thompson	14
Scattering	116

[1] Week ended Friday.

KANSAS.	Cases.
Chicken pox	118
Diphtheria	48
Influenza	7
Measles	523
Mumps	16
Pneumonia	18
Scarlet fever	111
Smallpox	203
Trachoma	1
Tuberculosis	75
Typhoid fever	3
Whooping cough	70

LOUISIANA.	
Cerebrospinal meningitis	1
Diphtheria	8
Poliomyelitis	2
Smallpox	41
Typhoid fever	26

MAINE.	
Chicken pox	11
Diphtheria	3
Influenza	124
Lethargic encephalitis	1
Measles	159
Mumps	7
Pneumonia	8
Scarlet fever	26
Smallpox	1
Tuberculosis	6
Typhoid fever	4
Whooping cough	16

MARYLAND.[1]	
Cerebrospinal meningitis	1
Chicken pox	58
Conjunctivitis	2
Diphtheria	28
German measles	3
Influenza	43
Malaria	1
Measles	128
Mumps	50
Pneumonia (all forms)	78
Poliomyelitis	1
Scarlet fever	47
Septic sore throat	1
Smallpox	2
Tuberculosis	73
Typhoid fever	10
Whooping cough	182

MASSACHUSETTS.	
Cerebrospinal meningitis	3
Chicken pox	232
Conjunctivitis (suppurative)	14
Diphtheria	165
German measles	23
Influenza	40
Lethargic encephalitis	2
Measles	794
Mumps	126
Ophthalmia neonatorum	20
Pellagra	1
Pneumonia (lobar)	150

MASSACHUSETTS—continued.

	Cases.
Poliomyelitis	1
Scarlet fever	230
Septic sore throat	4
Tetanus	2
Trachoma	2
Trichinosis	1
Tuberculosis (all forms)	170
Typhoid fever	7
Whooping cough	189

MINNESOTA.

Chicken pox	15
Diphtheria	74
Measles	48
Pneumonia	5
Poliomyelitis	1
Scarlet fever	133
Smallpox:	
Minneapolis	83
Scattering	230
Tuberculosis	64
Typhoid fever	26
Whooping cough	3

MISSISSIPPI.

Diphtheria	4
Scarlet fever	1
Smallpox	29
Typhoid fever	12

MONTANA.

Diphtheria	4
Scarlet fever	4
Smallpox	36
Typhoid fever	2

NEBRASKA.

Cerebrospinal meningitis:	
Davenport	1
Gage County	1
Chicken pox	25
Diphtheria	5
German measles	1
Influenza	1
Lethargic encephalitis—Omaha	1
Measles	145
Mumps	6
Pneumonia	4
Scarlet fever:	
Spalding	17
Scattering	83
Smallpox:	
Adams County	12
Bennington	11
Byron	12
Hitchcock County	10
Omaha	13
Walthill	12
Scattering	45
Tuberculosis	4
Typhoid fever	1
Whooping cough	2

NEW JERSEY.

Cerebrospinal meningitis	4
Chicken pox	205
Diphtheria	154

NEW JERSEY—continued.

	Cases.
Influenza	31
Measles	258
Pneumonia	133
Poliomyelitis	1
Scarlet fever	237
Smallpox	17
Trachoma	3
Trichinosis	1
Typhoid fever	9
Whooping cough	319

NEW MEXICO.

Chicken pox	6
Diphtheria	20
German measles	1
Measles	53
Mumps	4
Pellagra	1
Pneumonia	4
Scarlet fever	11
Smallpox	6
Tuberculosis	47
Typhoid fever	3
Whooping cough	17

NEW YORK.

(Exclusive of New York City.)

Cerebrospinal meningitis	3
Diphtheria	191
Influenza	38
Lethargic encephalitis	6
Measles	907
Paratyphoid fever	1
Pneumonia	259
Scarlet fever	231
Smallpox	21
Tetanus	1
Trachoma	3
Typhoid fever	26
Whooping cough	405

NORTH CAROLINA.

Cerebrospinal meningitis	3
Chicken pox	89
Diphtheria	21
German measles	7
Measles	700
Ophthalmia neonatorum	2
Poliomyelitis	1
Scarlet fever	12
Septic sore throat	6
Smallpox	112
Typhoid fever	10
Whooping cough	377

SOUTH DAKOTA.

Chicken pox	14
Diphtheria	16
Measles	75
Pneumonia	8
Scarlet fever	22
Smallpox	58
Tuberculosis	1
Typhoid fever	1

TEXAS.	Cases.
Chicken pox	50
Diphtheria	11
Influenza	24
Measles	151
Scarlet fever	12
Smallpox	32
Typhoid fever	7

VERMONT.	
Chicken pox	40
Diphtheria	11
Influenza	1
Measles	87
Mumps	12
Scarlet fever	15
Smallpox	6
Typhoid fever	2
Whooping cough	26

WASHINGTON.	
Chicken pox	70
Diphtheria	13
Influenza	12
Measles	82
Mumps	6
Pneumonia	3
Scarlet fever	16
Smallpox	123
Tuberculosis	11
Typhoid fever	4
Whooping cough	17

WEST VIRGINIA.	
Diphtheria	9
Measles:	
Elkins	9

WEST VIRGINIA—continued.	
Measles—Continued.	Cases.
Williamson	10
Scattering	24
Scarlet fever	19
Smallpox:	
Bluefield	20
Scattering	15
Typhoid fever	2

WISCONSIN.	
Milwaukee:	
Cerebrospinal meningitis	1
Chicken pox	57
Diphtheria	23
German measles	2
Lethargic encephalitis	1
Measles	4
Scarlet fever	37
Smallpox	16
Tuberculosis	28
Whooping cough	14
Scattering:	
Cerebrospinal meningitis	2
Chicken pox	168
Diphtheria	41
German measles	1
Influenza	79
Measles	90
Ophthalmia neonatorum	1
Poliomyelitis	2
Scarlet fever	147
Smallpox	139
Tuberculosis	13
Typhoid fever	1
Whooping cough	108

District of Columbia and Kentucky Reports for Week Ended Apr. 9, 1921.

DISTRICT OF COLUMBIA.	Cases.
Cerebrospinal meningitis	1
Chicken pox	34
Diphtheria	7
Influenza	2
Lethargic encephalitis	1
Measles	231
Scarlet fever	24
Tuberculosis	25
Typhoid fever	3
Whooping cough	21

KENTUCKY.	
Cerebrospinal meningitis:	
Jefferson County	1
Warren County	1
Chicken pox	13
Diphtheria:	
Jefferson County	8
Scattering	8
German measles	3
Influenza	11

KENTUCKY—continued.	
Measles:	Cases.
Boyd County	39
Grant County	23
Harlan County	8
Jefferson County	26
Scattering	14
Mumps	18
Paratyphoid fever	3
Pneumonia	14
Scarlet fever:	
Jefferson County	20
Scattering	11
Smallpox:	
Fulton County	30
Graves County	19
Knox County	9
Scattering	39
Tonsillitis	4
Trachoma	2
Tuberculosis:	
Jefferson County	15
Scattering	8
Typhoid fever	13
Whooping cough	28

SUMMARY OF CASES REPORTED MONTHLY BY STATES.

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State.	Cerebrospinal meningitis.	Diphtheria.	Influenza.	Malaria.	Measles.	Pellagra.	Poliomyelitis.	Scarlet fever.	Smallpox.	Typhoid fever.
1921.										
Alabama (March)	5	41	24	12	99	4	1	35	529	73
Colorado (February)	2	138	12	.....	978	1	2	95	289	5
Connecticut (March)	6	294	38	1	797	.....	2	575	1	14
Florida (March)	2	50	31	57	140	6	1	17	324	90
Massachusetts (March)	14	749	123	4	2,836	2	7	1,254	12	52
New Mexico (January)	.....	103	6	.....	670	.....	.....	37	11	8
New Mexico (February)	1	119	9	1	819	.....	.....	43	15	3
New Mexico (March)	1	177	4	3	525	1	.....	46	14	9
Vermont (March)	.....	25	3	.....	691	.....	.....	99	44	10

RECIPROCAL NOTIFICATION.

Connecticut—March, 1921.

Cases of communicable diseases referred during March, 1921, to other State health departments by Department of Health of the State of Connecticut.

Disease and locality of notification.	Referred to health authority of—	Why referred.
Diphtheria:		
Norwalk, Conn.	State Board of Health, Newark N.J.	Onset of disease five days after arrival in Norwalk, Conn., from Newark, N. J.
Measles:		
Warren, Conn.	do.	Onset day after arrival in Warren, Conn., from Montclair, N. J., where measles was present in her household.
Smallpox:		
Bethel, Conn.	State Department of Health, Albany, N. Y.	This case had been in contact with a smallpox case in Elmhurst, L. I.
Scarlet fever:		
Litchfield, Conn.	do.	Onset two days after arrival in Litchfield, Conn., from Pelham Manor, N. Y.
Hartford, Conn.	do.	Person left Hartford, Conn., for Brooklyn, N. Y., after contact with scarlet fever.
Groton, Conn.	do.	Onset of disease two days after arrival in Groton, Conn., from Ellis Island Immigration Station, New York City.
Watertown, Conn.	State Health Departments of following States: New York, Massachusetts, Ohio, Tennessee, Michigan, Missouri, Arkansas, Pennsylvania Indiana, California, Minnesota, North Carolina, Louisiana, West Virginia, Florida, Rhode Island, Kentucky, Illinois, Nebraska, New Jersey, Texas, Delaware, Wyoming, Oklahoma, Washington, Kansas, Washington, D. C.	200 pupils of private school in Watertown, Conn., returned home after exposure to scarlet fever cases.

PLAGUE.[1]

HUMAN CASES OF PLAGUE REPORTED.

Place.	Period covered.	Cases.	Deaths.	Remarks.
California:	1921.			
San Benito County	Feb. 7		1	

[1] A summary of the reports received of the occurrence of plague and the finding of plague-infected rodents in the United States during 1920 was published in Public Health Reports, Jan. 7, 1921, p. 15.

PLAGUE-INFECTED RODENTS.

Place.	Period covered.	Rodents found plague infected.
Florida:	1921.	
Pensacola	Jan. 1 to Mar. 9	4
	Mar. 10 to Apr. 16	0
Louisiana:		
New Orleans	Jan. 1 to Feb. 19	33
	Feb. 20 to Apr. 11	0
	Apr. 12	1
	Apr. 13 to 16	0

CITY REPORTS FOR WEEK ENDED APR. 2, 1921.

CEREBROSPINAL MENINGITIS.

The column headed "Median for previous years" gives the median number of cases reported during the corresponding weeks of the years 1915 to 1920, inclusive. In instances in which data for the full six years are incomplete, the median is that for the number of years for which information is available.

Place.	Median for previous years.	Week ended Apr. 2, 1921.		Place.	Median for previous years.	Week ended Apr. 2, 1921.	
		Cases.	Deaths.			Cases.	Deaths.
California:				Missouri:			
Los Angeles	0	1	.....	St. Louis	2	2	2
San Francisco	0	1	.....	New Jersey:			
Connecticut:				Bloomfield	0	1	.....
Bridgeport	0	1	.....	Phillipsburg	0	1	1
Illinois:				New York:			
Chicago	3	3	2	New York	12	9	2
East St. Louis	0	1	1	North Carolina:			
Maryland:				Greensboro	0	.....	1
Baltimore	1	1	.....	Ohio:			
Massachusetts:				Cleveland	1	1	.....
Boston	1	2	1	Pennsylvania:			
New Bedford	0	1	.....	Philadelphia	2	.....	1
Michigan:				Wisconsin:			
Detroit	2	.....	1	Superior	0	1	.....
Minnesota:							
St. Paul	0	.....	1				

DIPHTHERIA.

See p. 902; also Telegraphic weekly reports from States, p. 890, and Monthly summaries by States, p. 894.

CITY REPORTS FOR WEEK ENDED APR. 2, 1921—Continued.

INFLUENZA.

Place.	Cases.	Deaths.
Alabama:		
Birmingham		1
California:		
Alameda	1	
Long Beach	1	
Los Angeles	4	
Oakland	1	1
San Francisco	13	1
Connecticut:		
Hartford	3	
District of Columbia:		
Washington	1	1
Georgia:		
Savannah		1
Illinois:		
Chicago	11	4
Indiana:		
Terre Haute		1
Kansas:		
Lawrence		1
Louisiana:		
New Orleans		2
Maine:		
Portland	6	
Maryland:		
Baltimore	28	1
Cumberland	1	
Massachusetts:		
Boston	2	1
Chelsea	1	
Lynn	2	
North Adams	5	
Saugus	3	
Michigan:		
Detroit	4	1
Grand Rapids	1	
Minnesota:		
Minneapolis	4	
Missouri:		
Kansas City	2	5
New Jersey:		
Clifton	1	
Harrison	5	
New Jersey—Continued.		
Hoboken		1
Jersey City	1	
Kearny	19	
Passaic	1	
Trenton	3	
New York:		
Buffalo	2	
Mount Vernon	11	
New York	142	10
Niagara Falls	1	
North Tonawanda	4	
Saratoga Springs	2	
Schenectady	1	
Yonkers	1	1
North Carolina:		
Rocky Mount		1
Ohio:		
Canton	3	
Cincinnati		1
Oregon:		
Portland		1
Pennsylvania:		
Philadelphia	8	4
Rhode Island:		
Pawtucket		1
Providence	1	1
Tennessee:		
Nashville		2
Texas:		
Dallas	3	1
Utah:		
Salt Lake City	1	
Virginia:		
Roanoke	1	
Washington:		
Seattle	1	
West Virginia:		
Charleston		1
Huntington		1
Wisconsin:		
La Crosse	2	
Milwaukee	11	

LEPROSY.

Place.	Cases.	Deaths.
Louisiana:		
New Orleans	1	

LETHARGIC ENCEPHALITIS.

Place.	Cases.	Deaths.
Connecticut:		
Bridgeport	1	1
Illinois:		
Oak Park		1
New Jersey:		
Jersey City	1	
New York:		
Ithaca	1	1
Oregon:		
Portland	1	2
Wisconsin:		
Milwaukee	1	

CITY REPORTS FOR WEEK ENDED APR. 2, 1921—Continued.

MALARIA.

Place.	Cases.	Deaths.	Place.	Cases.	Deaths.
Alabama:			New Jersey:		
Birmingham	1		Hackensack	1	
Georgia:			New York:		
Atlanta	1		New York	1	
Brunswick	1		North Carolina:		
Savannah	4		Salisbury		1
Illinois:			Ohio:		
Chicago	1		Findlay	1	
Louisiana:			South Carolina:		
New Orleans	2	1	Charleston		2
Massachusetts:			Texas:		
Boston	1		Dallas	4	
Chelsea	1				
Michigan:					
Detroit	1				

MEASLES.

See p. 902; also Telegraphic weekly reports from States, p. 899, and Monthly summaries by States, p. 894.

PELLAGRA.

Place.	Cases.	Deaths.	Place.	Cases.	Deaths.
Alabama:			Michigan:		
Birmingham	1		Pontiac		1
Mobile		1	Virginia:		
Georgia:			Richmond	1	
Atlanta		1			

PNEUMONIA (ALL FORMS).

Alabama:			Georgia:		
Anniston	2		Atlanta		9
Birmingham		5	Savannah		1
Montgomery		2	Idaho:		
Arizona:			Boise	2	
Tucson		5	Illinois:		
Arkansas:			Alton	7	
Little Rock	1		Bloomington		1
California:			Chicago	185	50
Alameda		1	Danville	1	
Eureka		1	Decatur		1
Long Beach	1		East St. Louis		2
Los Angeles	28	14	Evanston	2	
Oakland		3	Galesburg	2	
Pasadena	2		Oak Park	7	1
Sacramento		2	Peoria		1
San Bernardino		1	Rockford		1
San Diego		1	Rock Island	1	
San Francisco	8	7	Indiana:		
Santa Barbara		2	East Chicago		3
Stockton		1	Elkhart		1
Colorado:			Fort Wayne		1
Colorado Springs		1	Gary		1
Denver		13	Hammond		1
Pueblo		1	Huntington		1
Connecticut:			Indianapolis		10
Bridgeport	3		Kokomo		1
Bristol	2		Marion		1
Greenwich	1		Mishawaka		1
Hartford	5	1	Muncie		1
Meriden	1		South Bend		1
Milford	1		Terre Haute		1
New Haven		7	Iowa:		
New London		1	Council Bluffs		2
Norwalk		1	Keokuk		1
Stonington		1	Muscatine	2	
Waterbury	4	2	Kansas:		
Delaware:			Arkansas City		1
Wilmington		2	Kansas City	2	
District of Columbia:			Wichita		4
Washington		11			

CITY REPORTS FOR WEEK ENDED APR. 2, 1921—Continued.

PNEUMONIA (ALL FORMS)—Continued.

Place.	Cases.	Deaths.
Kentucky:		
Covington		2
Louisville		6
Louisiana:		
New Orleans		9
Maine:		
Biddeford		3
Portland		2
Sanford	2	
Maryland:		
Baltimore	60	22
Cumberland	4	
Massachusetts:		
Adams	1	
Amesbury	1	
Attleboro		3
Beverly		2
Boston	43	32
Brockton	3	
Brookline		1
Cambridge		3
Chelsea	4	
Everett	2	1
Fall River		2
Gardner	1	
Greenfield	1	
Holyoke		3
Leominster	1	
Lowell		5
Lynn	3	1
Malden	4	2
New Bedford		7
Newton	3	2
Northampton	3	1
Peabody	1	
Plymouth		1
Salem	1	
Somerville	2	
Southbridge	2	
Springfield		1
Taunton		2
Westfield	1	
West Springfield	2	1
Worcester		4
Michigan:		
Ann Arbor	1	
Detroit	40	19
Flint		1
Grand Rapids	3	1
Hamtramck		2
Kalamazoo	1	
Pontiac	2	
Port Huron	6	2
Sault Ste. Marie	4	
Minnesota:		
Austin		1
Minneapolis		15
St. Paul		7
Missouri:		
Kansas City		8
St. Joseph		7
Montana:		
Anaconda		2
Billings		1
Butte		4
Great Falls	1	
Missoula		2
Nebraska:		
Omaha		3
Nevada:		
Reno		1
New Hampshire:		
Concord		1
Keene	1	
Manchester		5
New Jersey:		
Atlantic City	4	1
Bayonne	1	
Belleville	7	
Bloomfield	3	2
Clinton	2	1
Elizabeth		3
New Jersey—Continued.		
Garfield	1	
Gloucester City	3	
Hackensack	1	
Hoboken		2
Jersey City	14	
Kearny	2	
Montclair	3	1
Passaic		2
Perth Amboy		1
Summit	2	1
Trenton	8	3
New York:		
Albany	5	
Auburn	2	1
Buffalo	38	18
Elmira	1	
Ithaca		2
Jamestown	5	
Lockport		1
Middletown		1
Mount Vernon	4	2
Newburgh		3
New York	392	189
Niagara Falls	5	1
North Tonawanda	2	
Peekskill	3	
Port Chester	2	
Rochester	7	6
Rome	2	
Saratoga Springs		1
Schenectady	5	2
Syracuse		3
Troy		5
Watervliet		1
White Plains	4	2
Yonkers	13	5
North Carolina:		
Charlotte		1
Durham		2
Greensboro		2
Winston-Salem		1
North Dakota:		
Fargo		1
Ohio:		
Alliance		1
Barberton	3	1
Bucyrus	3	1
Canton		2
Cincinnati		19
Cleveland	27	24
Columbus		4
Cuyahoga Falls		1
Dayton	1	
Hamilton		1
Mansfield	4	3
Piqua		1
Toledo		2
Youngstown		7
Zanesville		1
Oklahoma:		
Oklahoma City		2
Oregon:		
Portland		2
Pennsylvania:		
Philadelphia	130	84
Rhode Island:		
Newport		1
Pawtucket		1
Providence		5
Tennessee:		
Nashville		4
Texas:		
Beaumont		1
Dallas	3	
El Paso		8
Fort Worth		1
Utah:		
Salt Lake City		3
Vermont:		
Burlington		2

CITY REPORTS FOR WEEK ENDED APR. 2, 1921—Continued.

PNEUMONIA (ALL FORMS)—Continued.

Place.	Cases.	Deaths.	Place.	Cases.	Deaths.
Virginia:			West Virginia—Continued.		
Alexandria		1	Wheeling		4
Danville		1	Wisconsin:		
Lynchburg		1	Green Bay		1
Petersburg		1	Madison		1
Richmond		3	Oshkosh		2
Roanoke	6	2	Racine		2
West Virginia:			Wausau	2	
Charleston		1	Wyoming:		
Huntington		1	Cheyenne		1

POLIOMYELITIS (INFANTILE PARALYSIS).

The column headed "Median for previous years" gives the median number of cases reported during the corresponding weeks of the years 1915 to 1920, inclusive. In instances in which data for the full six years are incomplete, the median is that for the number of years for which information is available.

Place.	Median for previous years.	Week ended Apr. 2, 1921.		Place.	Median for previous years.	Week ended Apr. 2, 1921.	
		Cases.	Deaths.			Cases.	Deaths.
Illinois:				Massachusetts:			
Chicago	1	1		Boston	0	1	
Louisiana:				Everett	0	1	
New Orleans	0	1		New York:			
				Ithaca		1	1

RABIES IN ANIMALS.

Place.	Cases.
Virginia:	
Petersburg	2

SCARLET FEVER.

See p. 902; also Telegraphic weekly reports from States, p. 890, and Monthly summaries by States, p. 894.

SMALLPOX.

The column headed "Median for previous years" gives the median number of cases reported during the corresponding weeks of the years 1915 to 1920, inclusive. In instances in which data for the full six years are incomplete, the median is that for the number of years for which information is available.

Place.	Median for previous years.	Week ended Apr. 2, 1921.		Place.	Median for previous years.	Week ended Apr. 2, 1921.	
		Cases.	Deaths.			Cases.	Deaths.
Alabama:				Colorado:			
Birmingham	4	12		Denver	18	18	
Mobile	0	3		Pueblo	1	13	
Montgomery	1	6		District of Columbia:			
Arkansas:				Washington	1	1	
Little Rock	1	3		Georgia:			
California:				Atlanta	4	13	
Long Beach	1	1		La Grange		1	
Los Angeles	4	2		Idaho:			
Oakland	0	9		Boise	8	1	
Richmond		3		Illinois:			
Riverside	0	1		Aurora	0	1	
Sacramento	0	6		Bloomington	0	2	
San Francisco	1	15		Blue Island		1	
Stockton	0	1		Centralia	0	1	

CITY REPORTS FOR WEEK ENDED APR. 2, 1921—Continued.

SMALLPOX—Continued.

Place.	Median for previous years.	Week ended Apr. 2, 1921. Cases.	Deaths.
Illinois—Continued.			
Chicago	3	4	
East St. Louis	1	8	
Evanston	0	3	
Freeport	0	8	
Galesburg	2	4	
Peoria	8	2	
Rockford	0	10	
Rock Island	1	1	
Springfield	4	3	
Indiana:			
Bloomington	0	1	
Crawfordsville	0	3	
Elkhart	1	12	
Fort Wayne	0	8	
Frankfort		1	
Gary	5	1	
Indianapolis	8	14	
Kokomo	0	2	
Logansport	2	2	
Marion	1	7	
Muncie	2	1	
South Bend	0	6	
Terre Haute	0	12	
Iowa:			
Burlington	1	1	
Cedar Rapids	2	6	
Council Bluffs	5	3	
Davenport	18	3	
Des Moines	3	9	
Dubuque	0	1	
Iowa City	1	1	
Keokuk	1	3	
Marshalltown	7	1	
Sioux City	2	22	
Kansas:			
Arkansas City		2	
Hutchinson	0	10	
Kansas City	4	17	
Salina		5	
Wichita	11	4	
Kentucky:			
Louisville	2	5	
Paducah	7	3	
Louisiana:			
Monroe		3	
New Orleans	9	9	
Maine:			
Waterville		1	
Maryland:			
Baltimore	1	10	
Cumberland	0	2	
Massachusetts:			
Boston	0	1	
Salem		1	
Michigan:			
Ann Arbor	1	1	
Detroit	3	37	
Flint	2	3	
Hamtramck		1	
Marquette	1	5	
Sault Ste. Marie	0	5	
Minnesota:			
Austin		3	
Duluth	2	14	
Mankato	0	5	
Minneapolis	13	62	
Rochester		4	
St. Cloud	0	1	
St. Paul	6	54	
Missouri:			
Joplin	2	1	
Kansas City	6	13	
St. Joseph	23	1	
St. Louis	6	23	
Montana:			
Billings	0	4	
Great Falls	1	3	
Missoula	0	2	
Nebraska:			
Lincoln	7	2	
Omaha	16	23	1
Nevada:			
Reno	0	2	
New Jersey:			
Union		4	
West New York		10	
New York:			
New York	1	1	
North Tonawanda		8	
North Carolina:			
Charlotte	0	3	
Durham	0	2	
Winston-Salem	1	20	
North Dakota:			
Fargo	0	6	
Grand Forks	1	3	
Ohio:			
Akron	2	3	
Canton	1	2	
Cincinnati	3	8	
Cleveland	3	4	
Columbus	0	4	
Dayton	0	2	
Hamilton		1	
Lancaster	0	4	
Lima	1	3	
Lorain	0	1	
Mansfield		1	
Marion	2	2	
Middletown	1	3	
Newark	0	1	
Springfield	1	1	
Toledo	3	32	
Oklahoma:			
Oklahoma City	10	3	
Tulsa		3	
Oregon:			
Portland	2	5	
Pennsylvania:			
Altoona	0	1	
Mount Carmel		1	
South Carolina:			
Charleston	0	10	
Columbia	0	1	
Tennessee:			
Chattanooga	3	20	
Knoxville	2	6	
Nashville	1	10	
Texas:			
Beaumont	0	2	
Dallas	15	3	
Port Arthur		6	
Utah:			
Salt Lake City	3	25	
Virginia:			
Lynchburg	0	1	
Roanoke	1	1	
Washington:			
Aberdeen	0	4	
Everett	0	4	
Seattle	2	27	
Spokane	12	57	
Tacoma	0	7	
Yakima	8	4	
West Virginia:			
Bluefield	6	3	
Charleston	2	1	
Fairmont	0	1	
Wisconsin:			
La Crosse	0	3	
Madison	2	11	
Marinette	0	3	
Milwaukee	8	29	
Oshkosh	3	6	
Sheboygan	0	4	
Superior	0	2	

CITY REPORTS FOR WEEK ENDED APR. 2, 1921—Continued.

TETANUS.

Place.	Cases.	Deaths.	Place.	Cases.	Deaths.
California:			New York:		
Los Angeles	1	1	Rochester	2	.....
Illinois:					
Chicago	1	2			

TUBERCULOSIS.

See p. 902, also Telegraphic weekly reports from States, p. 890.

TYPHOID FEVER.

The column headed "Median for previous years" gives the median number of cases reported during the corresponding weeks of the years 1915 to 1920, inclusive. In instances in which data for the full six years are incomplete, the median is that for the number of years for which information is available.

Place.	Median for previous years.	Week ended Apr. 2, 1921.		Place.	Median for previous years.	Week ended Apr. 2, 1921.	
		Cases.	Deaths.			Cases.	Deaths.
Alabama:				Minnesota:			
Birmingham	0	5	.....	Duluth	0	.....	1
California:				Minneapolis	1	2	.....
Alameda	0	1	.....	St. Paul	0	1	.....
Long Beach	0	1	.....	Missouri:			
Oakland	0	2	.....	St. Louis	2	1	1
Sacramento	0	1	.....	Montana:			
San Francisco	3	3	.....	Billings	0	1	.....
Colorado:				New Hampshire:			
Denver	0	1	1	Berlin	0	1	.....
District of Columbia:				New Jersey:			
Washington	1	1	.....	Summit	.....	1	.....
Georgia:				New York:			
Atlanta	1	1	.....	Buffalo	2	2	1
Brunswick	0	1	1	New York	7	10	2
Illinois:				Niagara Falls	0	1	.....
Chicago	3	3	.....	North Tonawanda	0	1	.....
Decatur	0	1	.....	Rochester	0	1	.....
Rock Island	0	.....	1	Schenectady	0	1	.....
Indiana:				Ohio:			
Fort Wayne	0	3	.....	Akron	0	2	.....
Kentucky:				Cleveland	3	1	.....
Louisville	1	3	.....	Columbus	0	1	.....
Louisiana:				Dayton	1	1	.....
New Orleans	1	2	.....	Fremont	0	1	.....
Maine:				Ironton	0	1	.....
Biddeford	0	1	.....	Pennsylvania:			
Maryland:				Allentown	1	1	.....
Baltimore	5	3	.....	Bethlehem	0	1	.....
Massachusetts:				Philadelphia	6	2	.....
Adams	0	1	.....	Warren	0	1	.....
Attleboro	0	.....	1	Wilkinsburg	1	1	.....
Boston	2	2	1	Rhode Island:			
Fall River	1	3	.....	Pawtucket	0	1	.....
Malden	0	1	.....	Tennessee:			
New Bedford	0	2	.....	Nashville	1	1	.....
Newburyport	0	1	.....	Texas:			
Pittsfield	0	.....	2	Dallas	0	1	1
Michigan:				West Virginia:			
Detroit	2	3	.....	Huntington	0	.....	1

CITY REPORTS FOR WEEK ENDED APR. 2, 1921—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS.

Place.	Population Jan. 1, 1920, subject to correction.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Alabama:										
Anniston	17,734				2				2	
Birmingham	178,270	50	1	1	3		1		8	7
Mobile	60,151	26	1		10	1				4
Montgomery	43,464	11					1			
Arizona:										
Tucson	20,292	22				1				2
Arkansas:										
Fort Smith	28,811		1		15		1			
Little Rock	54,997				33		1		12	
North Little Rock	14,048	1			3		1			
California:										
Alameda	28,806	8			2				3	
Eureka	12,923	7					2		1	1
Long Beach	55,593	22	2		15		1			2
Los Angeles	576,673	164	47	1	168	2	20	4	80	15
Oakland	216,361	31	5		3		14		4	2
Pasadena	45,354	10			93		2			1
Richmond	16,843	4					2			
Riverside	19,341	2					20			
Sacramento	65,857	23	4		1				3	4
San Bernardino	18,721	9			2					1
San Diego	74,683	28			3				10	7
San Francisco	508,410	167	31		30	1	11		28	6
Santa Barbara	19,441	6	3		5				3	
Santa Cruz	10,917	6								
Stockton	40,296	11			1		1			1
Vallejo	21,107	1					1			
Colorado:										
Colorado Springs	30,105	10								7
Denver	256,369	87	7		66		12			12
Pueblo	42,908		13		33					2
Connecticut:										
Bridgeport	143,538	26	6		1		19		3	3
Bristol	20,620	5	1		2		2		2	1
Danbury (town)	22,325	1	1							
Greenwich (town)	22,123				16		3			
Hartford	138,036	28	7	1	17		1		8	
Manchester (town)	18,370	1	1				1			
Meriden (city)	29,842		1				1		1	
Milford (town)	10,193						1		1	
New Haven	162,519	41	6		1		26		38	4
New London	25,688	9								1
Norwalk	27,700	6								
Norwich (town)	29,685								1	1
Stonington	10,236	3								
Waterbury	91,410	19	4		9		4		6	2
Delaware:										
Wilmington	110,168	31	2				2			
District of Columbia:										
Washington	437,571	109	8	1	275	1	19		19	15
Georgia:										
Atlanta	200,616	52	4	1	40		3		2	4
Brunswick	14,413	4								
La Grange	17,038				56					
Savannah	83,252	37	1							3
Idaho:										
Boise	21,393	6			32		2			
Illinois:										
Alton	24,682	3			6					
Aurora	36,397	12			5		1		2	2
Bloomington	28,725	5					4		2	
Blue Island	11,424	2	1				3			
Centralia	12,491	3			1		1			
Chicago	2,701,705	615	175	12	355	6	121	8	189	49
Danville	33,750	4					2			
Decatur	43,818	5	4		1		1			
East St. Louis	66,740	20	1		3		5		2	
Elgin	27,454	3			38					
Evanston	37,215	10	4		4		2			
Freeport	19,669	4	1				2		2	1
Galesburg	23,834	4			23				2	1
Jacksonville	15,713	8	1		14		1			2
Kewanee	16,026	5	2		25		6			

CITY REPORTS FOR WEEK ENDED APR. 2, 1921—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

Place.	Population Jan. 1, 1920, subject to correction.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Illinois—Continued.										
La Salle	13,050	3	2				2		1	
Oak Park	39,830	7	2		24		1			
Pekin	12,086						5			
Peoria	76,121	17	4	1			20		1	4
Rockford	65,651	15			21		16			2
Rock Island	35,177	4	2		2		3		1	1
Springfield	59,183	11	1		10		6			1
Indiana:										
Bloomington	11,595	1								
Crawfordsville	10,139	0					5			
East Chicago	35,967	14				1				
Elkhart	24,277	10	1		3		3			1
Fort Wayne	36,549	23	8		38		11			1
Frankfort	11,585	2			1		1			
Gary	55,378	19	4		1		1			
Hammond	36,004	6	2				1			1
Huntington	14,000	9			13		12			
Indianapolis	314,194	78	7	1	13		52		20	10
Kokomo	30,057	7					1		1	1
La Fayette	22,486	6	2				1		1	
Logansport	21,625	7					1			
Marion	23,747	6	4							
Mishawaka	15,195	4					2			
Muncie	36,624	8			3		1		1	1
South Bend	70,983	10	1		1		2		4	
Terre Haute	66,083	22	1		6		5			2
Iowa:										
Burlington	24,057	6	1				2			
Cedar Rapids	45,566		3				1			
Council Bluffs	36,162	9	2				6			
Davenport	56,727	2			1		5	1	1	1
Des Moines	126,468		5		1		4			
Dubuque	39,141		1		3					
Iowa City	11,257		2							
Keokuk	14,423	3			14					
Marshalltown	15,731				9		4			
Mason City	20,035	3					2			
Muscatine	16,038	4			18		1			
Sioux City	71,227		1				4			
Kansas:										
Arkansas City	11,253	3			8					
Atchison	12,630						6			
Coffeyville	13,452	4								
Hutchinson	23,298				1		3			
Kansas City	101,177		4		25		5		5	
Lawrence	12,455	2								
Leavenworth	16,912	7			5					
Parsons	16,028	3								
Salina	15,085	3	1				6			
Topeka	50,022	9	2		3		10		5	1
Wichita	72,128	19	3		84		8		3	
Kentucky:										
Covington	57,121	18					1		1	2
Lexington	41,534	14	1				1			1
Louisville	234,891	72	7		27		19		11	3
Louisiana:										
Monroe	12,675	6	1		1		1			1
New Orleans	387,219	109	4		2		7	1	17	15
Maine:										
Auburn	16,985	4	1		3					
Bangor	25,978						3			
Bath	14,731	5			1					2
Biddeford	18,008	10	1						2	2
Lewiston	31,791	7	2		2		2			1
Portland	69,272	15	2		40		4			
Sanford	10,691	5	1	1						
Waterville	13,351		1		7		1			
Maryland:										
Baltimore	733,826	248	25	3	57		19		25	29
Cumberland	29,837	4					2		2	1
Massachusetts:										
Adams	12,957	3								
Amesbury	10,033	3	3							

CITY REPORTS FOR WEEK ENDED APR. 2, 1921—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

Place.	Population Jan. 1, 1920, subject to correction.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Massachusettes—Continued.										
Arlington	18,665	1	2	.....	4	.....	2	.....	.....	.....
Attleboro	19,731	8	.....	.....	.....	.....	2	.....	2	1
Belmont	10,749	3	.....	.....	2	.....	.....	.....	.....	1
Beverly	22,561	7	.....	.....	.....	.....	2	.....	.....	.....
Boston	748,060	228	75	5	155	.....	56	3	49	17
Braintree	10,580	0	.....	.....	1	.....	.....	.....	.....	.....
Brockton	66,138	14	1	.....	1	.....	.....	.....	1	1
Brookline	37,748	11	.....	.....	.....	.....	5	.....	1	.....
Cambridge	109,694	31	4	.....	49	1	5	.....	5	3
Chelsea	43,184	9	3	1	19	.....	2	.....	2	.....
Chicopee	36,214	8	1	.....	.....	.....	.....	.....	2	1
Clinton	12,979	3	.....	.....	.....	.....	.....	.....	1	1
Danvers	11,108	.....	.....	.....	.....	.....	3	.....	.....	.....
Easthampton	11,261	.....	5	.....	.....	.....	.....	.....	1	.....
Everett	40,120	5	1	.....	1	.....	.....	.....	1	.....
Fall River	120,485	28	8	.....	13	.....	2	.....	6	1
Gardner	16,971	0	.....	.....	11	.....	.....	.....	3	.....
Greenfield	15,462	9	.....	.....	.....	.....	.....	.....	1	1
Holyoke	60,203	26	.....	.....	.....	.....	.....	.....	1	.....
Leominster	19,744	4	.....	.....	23	.....	7	.....	1	.....
Lowell	112,479	33	6	1	21	.....	1	.....	1	2
Lynn	99,148	25	4	1	1	.....	5	.....	1	3
Malden	49,103	16	5	.....	2	.....	3	.....	4	.....
Medford	39,038	8	5	.....	15	.....	4	1	.....	.....
Melrose	18,204	5	.....	.....	1	.....	1	.....	2	1
Methuen	15,189	4	.....	.....	.....	.....	5	.....	.....	.....
New Bedford	121,217	28	13	.....	1	.....	7	.....	10	2
Newburyport	15,618	5	.....	.....	1	.....	2	.....	.....	.....
Newton	46,054	12	.....	.....	2	.....	.....	.....	.....	1
North Adams	22,282	5	.....	.....	8	.....	.....	.....	.....	.....
Northampton	21,951	11	.....	.....	3	.....	.....	.....	1	1
Peabody	19,552	5	.....	.....	.....	.....	3	.....	.....	.....
Pittsfield	41,751	17	2	.....	2	.....	1	2	2	2
Plymouth	13,045	2	.....	.....	.....	.....	.....	.....	.....	1
Quincy	47,876	1	1	.....	2	.....	1	.....	.....	.....
Salem	42,529	13	.....	.....	4	.....	2	.....	3	2
Saugus	10,874	.....	.....	.....	11	.....	.....	.....	.....	.....
Somerville	93,091	24	9	1	3	1	4	.....	2	.....
Southbridge	14,245	2	.....	.....	4	.....	.....	.....	.....	.....
Springfield	129,563	32	4	.....	.....	.....	7	.....	3	.....
Taunton	37,137	12	1	1	.....	1	3	.....	1	1
Wakefield	13,025	1	.....	.....	.....	.....	1	.....	1	1
Watertown	21,457	4	.....	.....	.....	.....	.....	.....	1	.....
West Springfield	13,443	4	.....	.....	5	.....	2	.....	1	.....
Westfield	18,004	5	.....	.....	.....	.....	2	.....	.....	.....
Winthrop	15,455	0	.....	.....	.....	.....	1	.....	2	.....
Woburn	16,574	4	.....	.....	.....	.....	.....	.....	.....	.....
Worcester	179,754	51	6	2	.....	.....	12	.....	4	3
Michigan:										
Ann Arbor	19,516	8	1	.....	1	.....	6	.....	1	.....
Benton Harbor	12,233	.....	1	.....	.....	.....	.....	.....	.....	.....
Detroit	993,739	199	91	8	49	.....	84	7	67	19
Flint	91,599	18	3	.....	.....	.....	6	.....	.....	.....
Grand Rapids	137,634	35	5	3	3	.....	2	.....	.....	2
Hamtramck	48,615	15	9	1	4	.....	1	2	.....	1
Ironwood	15,739	1	.....	.....	2	.....	4	.....	.....	.....
Kalamazoo	48,858	20	.....	.....	2	.....	11	.....	2	2
Marquette	12,718	2	.....	.....	.....	.....	.....	.....	1	1
Pontiac	34,273	12	2	.....	.....	.....	.....	.....	.....	.....
Port Huron	25,944	7	2	.....	.....	.....	.....	.....	.....	.....
Sault Ste. Marie	12,096	3	.....	.....	10	.....	2	.....	.....	.....
Minnesota:										
Austin	10,118	5	.....	.....	.....	.....	.....	.....	.....	.....
Duluth	98,917	19	3	.....	.....	.....	9	.....	2	1
Hibbing	15,089	.....	1	.....	.....	.....	.....	.....	.....	.....
Minneapolis	380,582	96	10	2	13	.....	53	2	11	16
Rochester	13,722	14	.....	.....	5	.....	.....	.....	1	1
St. Cloud	15,873	.....	1	.....	1	.....	.....	.....	.....	.....
St. Paul	234,595	63	20	1	4	.....	28	.....	14	5
Virginia	14,022	.....	3	.....	.....	.....	.....	.....	.....	.....
Winona	19,143	.....	2	.....	.....	.....	.....	.....	.....	.....

CITY REPORTS FOR WEEK ENDED APR. 2, 1921—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

Place.	Population Jan. 1, 1920, subject to correction.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Missouri:										
Independence	11,686	5								
Joplin	29,855				1					
Kansas City	324,410	89	12	3	69		3		5	8
St. Joseph	77,939	29	1		23					
St. Louis	772,897	180	73		16	1	54		35	8
Montana:										
Anaconda	11,668	8								
Billings	15,100	3	1		21		1		1	
Butte	41,611	8								1
Great Falls	24,121	4			21		1		2	1
Missoula	12,668	8			8				1	
Nebraska:										
Lincoln	54,934	10	1		3		6		1	
Omaha	191,601	43	12	3	18		10			3
Nevada:										
Reno	12,016	3			1		1			
New Hampshire:										
Berlin	16,104	4								
Concord	22,167	13					5			1
Dover	13,029	4	1		4					1
Keene	11,210				1					
Manchester	78,384	17	7	1			5		5	
Portsmouth	13,569				1				2	
New Jersey:										
Asbury Park	12,400	2							1	
Atlantic City	50,682	11	6		7		5		5	2
Bayonne	76,754		3				9			
Belleville	15,660				9				1	
Bloomfield	22,019	5	2		1		3		1	
Clifton	26,470	2	1		3		2			
Elizabeth	95,682		10	1	21		2		2	1
Englewood	11,627	2			1		1			
Garfield	19,381		1		1		1			
Gloucester City	12,162						1			
Hackensack	17,667	8					7		1	
Harrison	15,721				4		2			
Hoboken	68,166	21	2	1	1		6			2
Irvington	25,480				1					
Jersey City	297,864		20		11		11		10	
Kearny	26,724	4	2		5		2			
Montclair	28,810	7			5		2		1	2
New Brunswick	32,779		12				1			
Orange	33,268	4	1		36		2		1	2
Passaic	63,824	17	4		6		5	1		1
Perth Amboy	41,707	10	10		1		5		3	
Phillipsburg	16,923	7								
Plainfield	27,700	4	6		3		1		2	
Rahway	11,042	4					3			1
Summit	10,174	3					1			1
Trenton	119,289	36	2		8		10		4	1
Union	20,651		3		6					
West Hoboken	40,068		3							
West New York	29,926	2	1							
West Orange	15,573	5			12					1
New York:										
Albany	113,344		2		47		5		3	
Auburn	36,192	12	1	1			2		3	1
Buffalo	506,775	126	31	1	54		12	1	17	9
Cohoes	22,987	7								
Elmira	45,305	12	1		1		3			
Geneva	14,648	3								
Glens Falls	16,638	4			5				1	1
Ithaca	17,004	6			7		1			
Jamestown	38,917	16	1		7		1			1
Lockport	21,308	9	8		11		3			
Middletown	18,420	2	1				5			
Mount Vernon	42,726	12	4				2			
Newburgh	30,366	14	2		1		2			1
New York	5,621,151	1,379	359	18	276	2	386	24	[1] 295	[1] 127
Niagara Falls	50,760	12	8		3		12			
North Tonawanda	15,482	3	4	1	4		1			

[1] Pulmonary tuberculosis only.

CITY REPORTS FOR WEEK ENDED APR. 2, 1921—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

Place.	Population Jan. 1, 1920, subject to correction.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
New York—Continued.										
Olean	20,506	4								
Peekskill	15,868	3					2			2
Plattsburg	10,909	4								
Port Chester	16,573	3	1		25		1			
Rochester	295,750	78	23	1	1		18	1	14	6
Rome	26,341		2		24				3	
Saratoga Springs	13,181	3			4				1	
Schenectady	88,723	16	6	1	24		1		3	1
Syracuse	171,717	38	22	1	45		13		5	3
Troy	72,013	20	1		22				3	2
Watervliet	16,073	8								
White Plains	21,031	6							1	
Yonkers	100,226	21	2	1	15		9			
North Carolina:										
Charlotte	46,338	9	1		33		1		10	2
Durham	21,719	6			2				6	1
Greensboro	19,861	10								
Rocky Mount	12,742	5								
Salisbury	13,884	4			2		1		1	
Winston-Salem	48,395	11	2		38				4	1
North Dakota:										
Fargo	21,961	12	2		4					
Grand Forks	14,010	0	1		6		1			
Ohio:										
Akron	208,435	48	1		8		9		6	
Alliance	21,603	10					2			
Barberton	18,811	5								
Bucyrus	10,425	4	2							
Canton	87,091	12	2	1	14		3			2
Cincinnati	401,247	115	18	2	15	1	8		15	11
Cleveland	796,836		13	2	35		39		36	20
Cleveland Heights	15,236				1		1			
Columbus	237,031	58	10	1	2		4		2	4
Cuyahoga Falls	10,200	2	1							
Dayton	152,559	41	1		2		2		2	
East Cleveland	27,292		2							
Findlay	17,021	1								
Fremont	12,468	2					3			
Hamilton	39,675	7	2		1		10		1	
Ironton	14,007	0	1				1			
Lancaster	14,706	4			6					1
Lima	41,306	6	1				2			
Lorain	37,295		2		12				2	
Mansfield	27,824	5			1		1		1	
Marion	27,891						1			
Middletown	23,594	5			1		2			
Newark	26,718	6							1	
New Philadelphia	10,718		1							
Niles	13,080	2			11		3		1	1
Norwood	24,966	2								
Piqua	15,044	4					2			
Salem	10,305	1								2
Sandusky	22,897	7			7		25		1	2
Springfield	60,840	15	1				1			
Steubenville	28,508	3	2							
Tiffin	14,375	8			6		10		1	8
Toledo	243,109	64	21		67	1	12	3	5	1
Youngstown	132,358	32	2							
Zanesville	29,569	12	2	1						
Oklahoma:										
Oklahoma City	91,258	25	4		2		4		3	1
Tulsa	72,075		2		10					
Oregon:										
Portland	258,288	62	16		80		3		2	9
Pennsylvania:										
Allentown	73,502		2		12		8			
Altoona	60,331		4		18		2			
Ambridge	12,730				10					
Berwick	12,181				1					
Bethlehem	50,358		1		17		3			
Braddock	20,879		5							
Bristol	10,273				1				1	
Butler	23,778		3		26		3			

CITY REPORTS FOR WEEK ENDED APR. 2, 1921—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

Place.	Population Jan. 1, 1920, subject to correction.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Pennsylvania—Continued.										
Carbondale	18,640		1		1					
Chambersburg	13,171				2					
Chester	58,030		1				3			
Coatesville	14,515						2			
Dickson City	11,049						1			
Duquesne	19,011		2							
Easton	33,813		2		13		2			
Erie	93,372		2		5		1		3	
Farrell	15,586				1					
Greensburg	15,033						3			
Harrisburg	75,917		1		22		2			
Hazleton	32,277		1		3					
Jeannette	10,627								1	
Johnstown	67,327		7		11					
Lancaster	53,150		10		1		6		1	
McKeesport	45,975		1		2		1		2	
McKee's Rocks	16,713		1		2					
Mahanoy City	15,599		2							
Mount Carmel	17,469				2					
New Castle	44,938				2					
Norristown	32,319		3				7		1	
North Braddock	14,928		2		3		7			
Philadelphia	1,823,158	566	72	6	41	2	126	6	81	66
Phoenixville	10,484				1					
Pittsburgh	588,193		14		39		21		14	
Plymouth	16,500				1					
Pottstown	17,431		5				2			
Pottsville	21,876		1		10		2			
Reading	107,784		3		19		9		4	
Scranton	137,783		1		9		3			
Shenandoah	24,726		1							
Steelton	13,428				2					
Sunbury	15,721		1							
Swissville	10,908				11					
Tamaqua	12,363						1			
Uniontown	15,692		1		2		5			
Warren	14,256						4			
Washington	21,480				2		3			
West Chester	11,717						2			
Wilkes-Barre	73,833		7		32		9		3	
Wilkinsburg	24,403				2		3			
York	47,512		3				1		1	
Rhode Island:										
Cranston	29,407	3			12		3			
Cumberland (town)	10,077						1			
East Providence (town)	21,793						1			
Newport	30,255	8	7	1			1			1
Pawtucket	64,248	18					2			
Providence	237,595	66	10		85	2	8			6
South Carolina:										
Charleston	67,957	25					1			2
Columbia	37,524				44				1	
Tennessee:										
Chattanooga	57,895		1				5		6	
Knoxville	77,818				4				2	
Nashville	118,342	37			7		8		2	4
Texas:										
Beaumont	40,422	11							1	
Dallas	158,475	32	2		129		2		5	5
El Paso	77,543	54				1				15
Fort Worth	106,482	13	3		11		1			1
Galveston	44,255	13	2							2
Port Arthur	22,251	4			1					
Utah:										
Salt Lake City	118,110	19	11		17		5		1	1
Vermont:										
Burlington	22,779	6			1					
Rutland	14,954	1			1					
Virginia:										
Alexandria	18,060	6		1	12					1
Danville	21,750									2
Lynchburg	29,956	10	1		38		3		1	
Petersburg	31,002	6			16				4	1

CITY REPORTS FOR WEEK ENDED APR. 2, 1921—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

Place.	Population Jan. 1, 1920, subject to correction.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Virginia—Continued.										
Portsmouth	54,387	10	2	.....	8	.....	3	.....	1	2
Richmond	171,667	36	1	.....	52	.....	2	.....	9	5
Roanoke	50,842	26	.....	.....	65	.....	2	.....	2	3
Washington:										
Aberdeen	15,337	.....	.....	.....	2	.....	.....	.....	.....	.....
Bellingham	25,570	.....	.....	.....	1	.....	1	.....	.....	.....
Everett	27,644	.....	.....	.....	5	.....	1	.....	.....	.....
Seattle	315,652	.....	7	.....	2	.....	3	.....	.....	.....
Spokane	104,437	.....	3	.....	10	.....	5	.....	.....	.....
Tacoma	96,965	.....	.....	.....	1	.....	4	.....	.....	.....
Vancouver	12,637	.....	.....	.....	11	.....	.....	.....	.....	.....
Walla Walla	15,503	.....	1	.....	.....	.....	1	.....	1	.....
Yakima	18,539	.....	.....	.....	.....	.....	1	.....	.....	.....
West Virginia:										
Bluefield	15,282	1	.....	.....	.....	.....	3	.....	.....	.....
Charleston	39,608	11	1	.....	3	.....	1	.....	.....	2
Fairmont	17,851	.....	1	.....	.....	.....	.....	.....	2	.....
Huntington	50,177	23	.....	.....	1	.....	.....	.....	.....	3
Morgantown	12,127	3	.....	.....	2	.....	4	.....	.....	.....
Moundsville	10,669	5	.....	.....	.....	.....	.....	.....	.....	.....
Parkersburg	20,050	5	.....	.....	2	.....	.....	.....	.....	.....
Wheeling	54,322	15	2	.....	7	.....	2	.....	.....	1
Wisconsin:										
Appleton	19,561	.....	.....	.....	.....	.....	7	.....	.....	.....
Beloit	21,284	1	2	.....	.....	.....	.....	.....	1	.....
Eau Claire	20,880	.....	1	.....	.....	.....	.....	.....	.....	.....
Fond du Lac	23,427	8	2	.....	.....	.....	.....	.....	.....	.....
Green Bay	31,017	12	1	.....	1	.....	1	.....	.....	.....
Janesville	18,293	3	1	.....	.....	.....	4	.....	.....	.....
Kenosha	40,472	11	4	1	1	.....	7	.....	.....	1
La Crosse	30,363	.....	.....	.....	.....	.....	5	.....	1	.....
Madison	38,378	7	1	1	1	.....	9	.....	2	.....
Marinette	13,610	.....	2	.....	1	.....	.....	.....	1	.....
Milwaukee	457,147	.....	35	.....	.....	.....	35	.....	22	.....
Oshkosh	33,162	16	.....	.....	1	.....	.....	.....	.....	.....
Racine	58,593	13	10	.....	.....	.....	4	.....	.....	1
Sheboygan	30,955	.....	.....	.....	1	.....	2	.....	.....	.....
Superior	39,624	8	2	.....	.....	.....	1	.....	5	1
Wausau	18,661	5	.....	.....	.....	.....	1	.....	1	.....
Wyoming:										
Cheyenne	13,829	1	.....	.....	.....	.....	1	.....	.....	.....

FOREIGN AND INSULAR.

CUBA.

Quarantine Against Jamaica on Account of "Alastrim."

Under date of April 5, 1921, quarantine measures were ordered into effect at Cuban ports against arrivals from the Island of Jamaica on account of the prevalence of "alastrim" in that island, these measures to be identical with those established, under date of January 19, 1921, against arrivals from Haiti, on account of smallpox.[1]

GREECE.

Recurrent Fever—Typhus Fever—Saloniki.

During the two weeks ended March 6, 1921, 382 cases of recurrent fever were reported at Saloniki, Greece, occurring among Russian refugees. During the same period 134 cases of typhus fever with 10 fatalities were reported at Saloniki, of which 129 cases occurred among refugees from Russia, the remainder being reported among the population of Saloniki. At localities in the vicinity of Saloniki, 27 cases of typhus fever with 2 fatalities were reported.

JAMAICA.

Infectious Disease (Alastrim or Kaffir Pox).

During the week ended March 26, 1921, 311 new cases of alastrim or Kaffir pox, were reported in the Island of Jamaica.

MEXICO.

Plague-Infected Rodents—Tampico.

During the week ended April 10, 1921, two plague-infected rodents were reported found at Tampico, Mexico.

POLAND.

Cholera—Typhus Fever—Year 1920.

Cholera.—According to information received through the ministry of public health of Poland, cholera made its appearance in Poland in September, 1920, occurring at first in sporadic form, becoming epidemic in some sections, declining rapidly after reaching its maximum prevalence, and becoming restricted to a small number of prisoners

[1] Public Health Reports, Feb. 11, 1921, p. 265.

of war and a few cases among the civil population. In the district of Warsaw the occurrence was stated to have been almost exclusively among persons arriving from other localities. In the districts of Posen and western Galicia or the district of Cracow the occurrence was stated to have been among prisoners. In the Grodno district 20 cases, not verified, were stated to have occurred among prisoners and 2 cases among civilians.

Typhus fever.—The data obtainable with regard to typhus fever were stated to contain some discrepancies and the reports for the months of November and December, 1920, to be incomplete and not to include the Grodno and Vilna districts. The following statement presents the reported occurrence, distributed according to months, for the year 1920:

Year 1920.	Cases.	Year 1920.	Cases.
January	34,530	August	1,388
February	25,858	September	1,650
March	27,843	October	2,195
April	24,616	November	[1] 652
May	24,339	December	[1] 1,080
June	12,329		
July	5,386	Total	161,845

Cholera—March, 1921.

On March 1, 1921, 31 cases of cholera were reported present in the Posen district. The total number of cases of cholera reported present in all Poland, March 15, 1921, was: Among prisoners, 86; among civil population, 9; among military, 2.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER.

Reports Received During Week Ended Apr. 22, 1921.[2]

CHOLERA.

Place.	Date.	Cases.	Deaths.	Remarks.
India				Jan. 9-15, 1921: Deaths, 1,302.
Calcutta	Feb. 20-26	39	29	
Madras	Feb. 27-Mar. 5	8	4	
Poland				Mar. 15, 1921: Cases present, 86 among prisoners; 9 in civil population; 2 among military.
Posen district	Mar. 1	31		

PLAGUE.

Brazil:				
Bahia	Feb. 20-Mar. 12	3	3	
Ceylon:				
Colombo	Feb. 20-Mar. 5	26	22	
China:				
Chihli Province	Apr. 12			On Tientsin-Pukow R. R., about 60 miles from Tientsin. Reappearance. Pneumonic.
Kwangtung Province—				
Tapu district	Mar. 7			Recurrence.
Manchuria Province—				
Harbin	Feb. 21-Mar. 6	260		West of Harbin, Apr 13, improving; east of Harbin more serious.

[1] See Public Health Reports, Apr. 1, 1921, p. 603, and Mar. 25, 1921, p. 630, for complete reports for these months.

[2] From medical officers of the Public Health Service American consuls, and other sources.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.

Reports Received During Week E ded Apr. 22, 1921—Continued.

PLAGUE—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Egypt				Jan. 1–Mar. 10, 1921: Cases, 33; deaths, 19.
Cities—				
Alexandria	Mar. 6	1		
Suez	Mar. 3		1	
Provinces—				
Girgeh	Mar. 7	3		
Minieh	Mar. 3	1	1	
India				Feb. 13–26, 1921: Cases, 7,639; deaths, 6,174.
Bombay	Feb. 13–19	12	9	
Madras Presidency	Feb. 27–Mar. 5	840	613	
Mexico:				
Tampico				Rodent plague, Mar. 14, 1921. Apr. 10, 1921: 2 plague-infected rodents found.
Peru:				
Trujillo-Salaverry	Feb. 28–Mar. 13	4	3	
Portuguese West Africa:				
Angola—				
Loanda	Apr. 8			Rat plague still present, but abating.

SMALLPOX.

Canada:				
New Brunswick—				
Bonaventure and Gaspe Counties	Mar. 1–31	12		
Nova Scotia—				
Yarmouth	Mar. 20–26	1		
Ontario—				
Hamilton	Apr. 3–9	4		
Kingston	Mar. 20–26	1		Feb. 21–27, 1921: One case.
London	Mar. 27–Apr. 2	1		
North Bay	Mar. 20–Apr. 2	2		
Ottawa	Mar. 27–Apr. 2	22		
Prescott	Apr. 3–9	1		
Toronto	Mar. 20–Apr. 2	11		
Saskatchewan—				
Moose Jaw	Mar. 27–Apr. 2	1		
Regina	Mar. 27–Apr. 2	2		
Saskatoon	Mar. 13–19	3		
Chile:				
Coquimbo	Feb. 13–19	2		
China:				
Antung	Feb. 28–Mar. 6	1	1	
Tientsin	Feb. 27–Mar. 5	3		
Cuba:				
Antilla	Mar. 27–Apr. 2	4		
Nuevitas	Mar. 28–Apr. 3	1		
France:				
Rouen	Mar. 6–12	1		
India				Jan. 9–15, 1921: Deaths, 491.
Bombay	Feb. 13–19	39	15	
Karachi	Feb. 27–Mar. 5	7		
Madras	Feb. 27–Mar. 5	7	2	
Italy:				
Catania	Mar. 14–20	7		In Province.
Messina	Mar. 7–13	7	4	In Province, 12.
Java:				
West Java—				
Batavia	Feb. 10–16	1		
Buitenzorg	do	9		
Lebak	do	3	1	
Pandeglang	do	2		
Jugoslavia:				
Belgrade	Feb. 27–Mar. 5	1		
Madeira:				
Funchal	Mar. 13–19		1	
Mexico:				
Mexico City	Mar. 6–12	15		Including municipalities in Federal District.
Newfoundland:				
Bonne Bay	Mar. 26–Apr. 1	1		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.

Reports Received During Week Ended Apr. 22, 1921—Continued.

SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Panama:				
Colon	Mar. 23-29	4		
Portugal:				
Lisbon	Feb. 27-Mar. 12		3	
Portuguese East Africa:				
Chai-Chai	Jan. 2-29			Present.
Chinde	Jan. 2-8			Do.
Inhambane District	do			Do.
Spain:				
Barcelona	Mar. 3-9		2	
Valencia	Feb. 27-Mar. 12	4		
Tunis:				
Tunis	Mar. 12-18	5	5	
On vessel:				
S. S. ——	Mar. 27-Apr. 2	2	1	At quarantine, St. John, New Brunswick. From Europe.

TYPHUS FEVER.

Bulgaria:				
Sofia	Feb. 20-Mar. 12	5		
Colombia:				
Barranquilla	Mar. 13-19		1	
Egypt:				
Cairo	Jan. 22-28	3	3	
Great Britain:				
Belfast	Mar. 13-19	2		
Greece:				
Drama	Feb. 28-Mar. 6	1		
Kavalla	do	2		
Saloniki	Feb. 28-Mar. 13	134	10	Of these, 129 cases among Russian refugees. At other localities, 27 cases, 2 deaths.
Japan:				
Nagasaki	do	10	1	
Mexico:				
Mexico City	Mar. 6-12	18		Including municipalities in Federal district.
San Luis Potosi	Mar. 27-Apr. 2		1	
Poland				Year 1920: Cases, 161,846.
Portugal				Jan. 1-Feb. 28, 1921: Deaths, 3.
Oporto	Mar. 22-28	2	1	
Russia:				
Latvia—				
Riga	Jan. 8-31	151		

Reports Received from Jan. 1 to Apr. 15, 1921.

CHOLERA.

Place.	Date.	Cases.	Deaths.	Remarks.
China:				
Canton	Nov. 1-30	7	6	
Changsha	Nov. 29			Present.
Chungking	do			Do.
Chosen (Korea)				Aug. 1-Dec. 2, 1920: Cases, 24,017; deaths, 13,329.
India				Sept. 26-Oct. 9, 1920: Deaths, 2,672. Oct. 31-Dec. 11, 1920: Deaths, 7,181. Jan. 2-8, 1921: Deaths, 1,678.
Bombay	Dec. 5-11	2	2	
Do	Jan. 16-Feb. 12	3	2	
Calcutta	Oct. 31-Dec. 25	321	283	
Do	Dec. 26-Feb. 19	441	352	
Madras	Dec. 12-18	77	44	
Do	Dec. 26-Feb. 26	193	106	
Rangoon	Nov. 28-Dec. 25	9	8	
Do	Dec. 26-Feb. 5	22	20	
Indo-China				July 1-31, 1920: Cases, 136; deaths, 98.
Saigon	Dec. 27-Jan. 9	1	1	Including surrounding country.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.

Reports Received from Jan. 1 to Apr. 15, 1921—Continued.

CHOLERA—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Japan:				
Taiwan Island (Formosa)	Nov. 11-Dec. 31	219	93	
Do	Jan. 1-20	2		
Java:				
West Java—				
Bandoeng	Oct. 29-Nov. 11	2	1	
Batavia	Nov. 25-Dec. 1	1		
Philippine Islands:				
Manila	Nov. 7-Dec. 25	9		
Do	Jan. 9-Feb. 26	10		
Provinces—				
Cagayan	Oct. 3-Nov. 20	11	9	
Samar	Aug. 1-7	1	1	
Poland				Oct. 1-31, 1920: Cases, 26; deaths, 13.
Eastern frontier—				
Bialystok	Dec. 16			Present.
Galicia	Nov. 1-30	19	11	
Grodno	do			Do.
Olitza	do			Do.
Posen	do			Present in Russian prison camp.
Stralkowo	do			
Strelno	do	1	1	
Warsaw	Oct. 1-31	2		In district.
Do	Dec. 16	5		Nov. 1-30, 1920: Cases, 7; deaths, 2.
Russia:				
Lithuania				Feb. 19, 1921: Cases reported, 35; mortality, 30 per cent.
Latvia—				
Riga	Jan. 22			Present.
Siam:				
Bangkok	Oct. 9-Nov. 7	7	1	
Do	Dec. 26-Jan. 22	3		

PLAGUE.

Algeria:				
Algiers	Nov. 1-Dec. 31	3	1	
Do	Jan. 1-31	3	1	
Argentina:				
Rosario				Jan. 1-31, 1921; 3 plague rodents found.
Azores:				
Ft. Michaels				Total, Oct. 1-Dec. 10, 1920: Cases, 149; deaths, 49. In vicinity of Ponta Delgada.
Ponta Delgada	Feb. 5-11	1		
Brazil:				
Bahia	Oct. 31-Dec. 18	6	4	
Do	Dec. 26-Feb. 12	11	1	
Ceara	Oct. 17-Feb. 5		16	
Pernambuco	Oct. 18-Dec. 5	1	3	
Porto Alegre	Nov. 14-Dec. 11		2	
Do	Dec. 26-Feb. 19		7	
British East Africa				Outbreak Nov. 8, 1920: Cases reported, 1,067.
Kenya Colony—				
Kisumu	Oct. 31-Dec. 25			Present.
Do	Dec. 26-Feb. 12			Do.
Mombassa	Oct. 31-Dec. 25	2	2	
Do	Dec. 26-Jan. 15			Do.
Nairobi	Oct. 31-Dec. 25	16	11	
Do	Jan. 2-Feb. 5	19	15	Pneumonic, present.
Uganda	Oct. 21-Dec. 25	111	103	Entire protectorate.
Do	July 1-Nov. 5	259	63	Do.
Ceylon:				
Colombo	Nov. 7-Dec. 18	18	60	
Do	Jan. 16-Feb. 19	76	65	
Chile:				
Antofagasta	Nov. 24-Dec. 5	6	2	
Do	Dec. 27-Jan. 2	2		
China:				
Chihli Province				Mar. 11, 1921: Present on Tientsin & Pukow R. R., 70 miles east of Tientsin. Pneumonic.
Peking	Jan. 25		1	Chinese quarter.
Fan Yuan	Mar. 3		50	In Northern Shantung Province.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.

Reports Received from Jan. 1 to Apr. 15, 1921—Continued.

PLAGUE—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
China—Continued.				
Hongkong	Nov. 7–Dec. 18	6	6	
Do	Jan. 9–15	1	1	
Kwantung Province	Dec. 29			Reported present in Tapu district.
Manchuria Province—				
Changchun	Feb 18	15		
Harbin	Feb. 2–Mar. 26		148	West of Harbin, Feb. 7, 1921, 400 fatal cases reported. Feb. 14, 1921, fatal cases, 1,200. To Mar. 14, 1921: 4,000 fatal cases. Pneumonic. Fatal cases reported daily, about 40.
Manchuria station	Jan. 1–Mar. 10		283	
Mukden	Feb. 20–26			Prevalent. Pneumonic.
Tsitsihar	Feb. 2–Mar. 10			Present.
Shanghai				Two plague rats found Dec. 29 and Dec. 31, 1920.
Ecuador:				
Guayaquil	Nov. 16–Dec. 31	111	36	
Do	Jan. 1–Feb. 15	135	47	
Egypt				Jan. 1–Dec. 30, 1920: Cases, 462; deaths, 269. Jan. 1–Feb. 17, 1921: Cases, 20; deaths, 13.
Cities—				
Alexandria	Jan. 17–22	1	1	
Port Said	Oct. 22–28	1	1	
Do	Jan. 22	1	1	
Suez	Nov. 18–27	10	3	
Do	Jan. 5–Feb. 13	12	9	Pneumonic, 6 cases; septicemic, 1 case.
Province—				
Assiout	Nov. 24	3	2	
Mineh	Feb. 14–15	4		
France:				
Marseille	June–Aug. 31	58	20	
Paris	June–Oct. 15	50	11	In suburbs, June–Nov. 2, 1920: Cases, 38; deaths, 19.
Do				Jan. 1–13, 1921: Cases, 3; deaths, 1. (Suspect.)
Great Britain:				
Dublin				1 case reported Dec. 15, 1920, date of occurrence, Oct. 18, 1920.
Liverpool				Plague-infected rat found, period Nov. 28–Dec. 11, 1920.
Greece:				
Kavala	Oct. 25–Nov. 7	2		
India				Oct. 24–Dec. 25, 1920: Cases, 21,376; deaths, 14,874. Jan. 2–Feb. 12, 1921: Cases, 29,213; deaths, 22,573.
Bombay	Nov. 28–Dec. 25	6	6	
Do	Dec. 26–Feb. 12	17	11	
Calcutta	Nov. 14–20	46	44	
Do	Jan. 30–Feb. 12	1	1	
Karachi	Dec. 25–31	2	2	
Madras	Dec. 5–25	7	4	
Do	Jan. 9–29	3	1	
Madras Presidency	Nov. 14–Dec. 25	4,349	2,991	
Do	Dec. 26–Feb. 26	8,533	6,151	
Rangoon	Oct. 31–Dec. 25	30	28	
Do	Dec. 26–Feb. 19	92	84	
Indo-China				July 1–31, 1920: Cases, 98; deaths 74.
Saigon	Dec. 27–Jan. 9	2	2	Including surrounding country.
Java:				
West Java—				
Batavia	Nov. 21–Dec. 1	3	3	
Do	Jan. 13–26	1	2	
Jugoslavia:				
Cattaro	Feb. 23	3		Among French troops.
Madagascar:				
Tamatave	Mar. 9			Present.
Mesopotamia:				
Bagdad	Oct. 1–31	25	7	
Mexico:				
Carbonera	Dec. 5–20	3	1	State of San Luis Potosi. Dec. 1920–Feb. 12, 1921: Cases, 24.
Do	Dec. 26–Jan. 8	3		
Cerritos	Dec. 5–20	7	8	State of San Luis Potosi.
Do	Dec. 26–Feb. 5	5		
Tampico	Mar. 23–30	4	2	
Vera Cruz				Mar. 21–27, 1921: Two plague infected rodents found.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.

Reports Received from Jan. 1 to Apr. 15, 1921—Continued.

PLAGUE—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Paraguay:				
Asuncion	Feb. 4	1	1	
Peru				July-December, 1920: Cases, 292; deaths, 133. Jan.-Feb. 28, 1921: Cases, 141; deaths, 71.
Departments—				
Callao-Lima				July-December, 1920: Cases, 23; deaths, 10. Jan. 1-31, 1921: Cases, 3; deaths, 2.
Callao	Feb. 1-15	2		
Libertad	do	1		
Trujillo-Salaverry	Dec. 27-Feb. 27	25	4	
Lima	Feb. 1-15	14	4	
Piura	do	21	10	
Porto Rico:				
San Juan	Feb. 18-25	7	2	Feb. 17-Mar. 3, plague rats found, 19.
Portuguese West Africa:				
Angola—				
Loanda				Mar. 18, 1921: Rat plague present.
Russia:				
Batum	Nov. 24-Dec. 3	38		Epidemic outbreak.
Siam:				
Bangkok	Dec. 5-11	1	1	
Straits Settlements:				
Singapore	Oct. 31-Nov. 6	1	1	
Tunis:				
Ben Gardane				June-July, 1920: Cases, 6. November-December, 1920: Cases, 10, in surrounding territory.
Zarzis	Jan. 25	1		Jan. 15, 1921: 10 cases notified in vicinity. (Corrected report received Mar. 30, 1921.)
Turkey:				
Constantinople	Nov. 21-27	1	2	
Union of South Africa:				
Orange Free State—				
Hoopstad district	Nov. 28-Dec. 18	3	1	1 European, 2 natives. On Vryheid Farm. (Public Health Reports, June 25, 1920, p. 1560.)
Do	Jan. 23-Feb. 5	1	1	In European; on farm.
Kroonstad district	Jan. 23-Feb. 26	4	3	On farms. Plague-infected wild rodents found.
On vessel:				
S. S. Kronprincessan Victoria.	Jan. 15			At Stockholm, Sweden. Rat plague found. Vessel left Buenos Aires, Argentina, Nov. 17, 1920. Stopped at Goteborg and Malmo, Sweden. Left Malmo Jan. 11, 1921. Rats found dead Jan. 13, 1921, at Stockholm.

SMALLPOX.

Algeria:				
Algiers	Jan. 1-31	5		
Austria				Aug. 29-Dec. 25; 1920: Cases, 75.
Azores:				
Ponta Delgada	Dec. 18-24	7		
Bolivia:				
La Paz	Oct. 1-Dec. 31	19	7	
Brazil:				
Bahia	Oct. 31-Dec. 25	6		
Do	Jan. 8-15	4		
Pernambuco	Oct. 18-Dec. 19	102	2	
Do	Dec. 27-Jan 30	36		
Rio de Janeiro	Oct. 24-Dec. 25	108	24	
Do	Dec. 25-Feb. 5	21	6	
Sao Paulo	Dec. 13-19		1	
British East Africa:				
Kenya Colony—				
Mombasa	Jan. 23-29	1		
Uganda				May 1-June 30, 1920: Cases, 272.
Bulgaria:				
Sofia	Nov. 7-13	2		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.

Reports Received from Jan. 1 to Apr. 15, 1921—Continued.

SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Canada:				
Alberta—				
Calgary	Dec. 12–18	2		
Do	Jan. 2–Feb. 19	15		
British Columbia—				
Fernie	Feb. 6–12	2		
Vancouver	Dec. 5–11	1		
Do	Dec. 26–Mar. 19	21		
Victoria	Jan. 30–Mar. 5	5		
Manitoba—				
Winnipeg	Jan. 16–Mar. 19	17		
New Brunswick				From lumber camp on Canadian Government R. R., Feb. 5, 1921, 5 cases.
Bonaventure and Gaspe Counties.	Feb. 1–28	4		
Campbellton	Jan. 9–15			Present.
Gloucester County	Jan. 23–29	1		
Madawaska County	Jan. 30–Feb. 19	2		
Northumberland County.	Mar. 6–12	1		
Restigouche County	Dec. 12–18	1		
Do	Feb. 6–19	2		
St. Stephen	Feb. 27–Mar. 5	1		
York County	do	6		
Nova Scotia—				
Sydney	Feb. 13–Mar. 26	15		
Yarmouth	Jan. 9–Mar. 5	7		
Ontario				November-December, 1920: Cases, 992; deaths, 5. Jan. 1–31, 1921: Cases, 902; deaths, 3.
Hamilton	Dec. 19–31	9		
Do	Jan. 2–Apr. 2	67		
Kingston	Dec. 26–Jan. 19	9		
London	Jan. 2–Mar. 26	32		
Montreal	do	13		
Niagara Falls	Dec. 12–18	1		
North Bay	Dec. 12–25	4		
Do	Jan. 2–Mar. 19	27		
Ottawa	Dec. 12–25	75	1	
Do	Dec. 26–Mar. 26	631	2	
Peterborough	do	3		
Sarnia	Feb. 20–Mar. 5	2		
Sault Ste. Marie	Jan. 9–Feb. 12	48		
Toronto	Dec. 12–25	7		
Do	Dec. 26–Mar. 19	56		
Quebec—				
Quebec	Jan. 23–Feb. 19	2		
Saskatchewan—				
Moose Jaw	Dec. 19–25	1		
Do	Jan. 2–Mar. 12	42		
Regina	Dec. 12–25	11		
Do	Jan. 2–Mar. 26	52		
Saskatoon	Dec. 16–22	20		
Do	Jan. 9–Mar. 26	25		
Ceylon:				
Colombo	Nov. 21–Dec. 25	18	7	
Do	Dec. 26–Feb. 19	5	2	
Chile:				
Iquique				Epidemic with high mortality.
China:				
Amoy	Nov. 7–Dec. 25		7	
Do	Dec. 26–Feb. 5		5	
Antung	Dec. 20–26	1		
Do	Jan. 10–Feb. 13	2	2	
Canton	Dec. 1–31			Present.
Do	Jan. 1–31			Do.
Chungking	Nov. 7–Dec. 25			Do.
Do	Dec. 26–Feb. 5			Do.
Foochow	Nov. 7–Dec. 25			Do.
Do	Dec. 26–Feb. 12			Do.
Hankow	Jan. 2–22	2	1	
Manchuria Province—				
Dairen	Nov. 16–Dec. 20	12	3	
Do	Dec. 28–Feb. 13	144	23	
Mukden	Dec. 12–18			Prevalent.
Do	Jan. 16–Feb. 26			Present.
Nanking	Nov. 14–Dec. 18			Do.
Do	Dec. 26–Feb. 13			Do.
Shanghai	Feb. 7–13	1		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.

Reports Received from Jan. 1 to Apr. 15, 1921—Continued.

SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
China—Continued.				
Tientsin	Nov. 14-Dec. 4	2		Dec. 12-25, 1920: Cases, 160; in camp for famine refugees.
Do	Dec. 26-Feb. 26	6		In camp for famine refugees, 477.
Tsinanfu	Oct. 31-Nov. 12	20		Statistics of Shantung Christian Hospital.
Tsingtau	Jan. 3-Feb. 13	3	1	
Chosen (Korea):				
Chemulpo	Dec. 1-31	1		
Fusan	Nov. 1-30	1		
Do	Jan. 1-31	4	1	
Gensan	Dec. 1-31	15	12	
Do	Jan. 1-31	24	8	
Colombia:				
Barranquilla	Jan. 16-Mar. 12			Present.
Santa Marta	Dec. 5-25			Do.
Do	Dec. 26-Mar. 19			Do.
Cuba:				
Antilla	Dec. 7-27	10		For port of Preston.
Do	Jan. 2-Mar. 19	87		Do.
Camaguey Province				Reported seriously prevalent during January, 1921. Mar. 17, 1921: 383 cases reported. M
Cienfuegos	Mar. 13-19	1		1 from Jatibonico, Cuba; 1 from Jamaica.
Habana	Dec. 31-Feb. 16	11		Vicinity of Nuevitas. Dec. 6-12, 1920: 1 case.
Lugareno	Mar. 7-13	2		
Matanzas	Jan. 2-29	6		
Nuevitas	Dec. 6-19	2		
Do	Jan. 3-Mar. 27	36		Mar. 17, 1921: 394 cases reported.
Oriente Province				
Santiago	Nov. 20-Dec. 10	23		"Alastrim" reported present; cases, estimated, about 1,000.
Do	Feb. 1-Mar. 20	265		July 11-Aug. 14, 1920: Cases, 141; deaths, 29.
Czechoslovakia				
Danzig	Dec. 5-18	2		Nov. 15-Dec. 25, 1920: Cases, 9; occurring in 4 localities.
Dominican Republic				
Santo Domingo	Jan. 9-Feb. 19	13	1	
Ecuador:				
Guayaquil	Nov. 16-Dec. 31	33	2	
Do	Jan. 1-Feb. 15	32		
Egypt:				
Alexandria	Dec. 17-31	3	1	
Do	Jan. 1-Mar. 4	9	1	
Cairo	Oct. 1-Dec. 9	3		
Do	Jan. 8-14	1		
Port Said	Nov. 19-Dec. 31	1	1	
Do	Jan. 8-14		1	
France:				
Paris	Nov. 1-30	2	1	
Do	Jan. 1-31	7	1	
Rouen	Nov. 21-Dec. 31	7	2	
Do	Feb. 13-27	2		
St. Etienne	Dec. 3-15	2	1	
Do	Jan. 23-Feb. 12	3		
Germany				Aug. 29-Nov. 6, 1920: Cases, 40.
Great Britain:				
Glasgow	Dec. 25	11	2	
Do	Jan. 2-Mar. 19	23	8	
Liverpool	Jan. 30-Feb. 5	1		
London	Dec. 25-Jan. 1	1		
Greece:				
Saloniki	Nov. 15-Dec. 23	39	14	In surrounding country: Cases, 21; deaths, 2.
Do	Dec. 27-Feb. 5	21	18	Sept. 22, 1920-Jan. 8, 1921: Cases, 2,232; deaths, 61.
Haiti				
Cape Haitien	Feb. 13-Mar. 12	23		In 8 interior towns, 20 cases. In one locality, 18 cases. In country district, vicinity of Port au Prince, cases numerous. From date of outbreak to Feb. 11, 1921: Cases, 2,874; deaths, 221.
Port au Prince	Sept. 22-Dec. 2	483	2	
Honduras:				
Ceiba	Feb. 13-Mar. 5	4		Sept. 23-Oct. 9, 1920: Deaths, 230. Oct. 31-Dec. 11, 1920: Deaths, 3,902. Dec. 19-25, 1920: Deaths, 353. Dec. 25, 1920-Jan. 8, 1921: Deaths, 728.
India				
Bombay	Nov. 7-Dec. 25	11	3	
Do	Dec. 26-Feb. 12	80	16	
Calcutta	Dec. 5-11	2	2	
Do	Jan. 2-Feb. 19	12	7	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.

Reports Received from Jan. 1 to Apr. 15, 1921—Continued.

SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
India—Continued.				
Karachi	Jan. 16–Feb. 26	22	2	
Madras	Nov. 14–Dec. 18	7	5	
Do	Dec. 26–Feb. 26	33	5	
Rangoon	Nov. 21–Dec. 25	5	1	
Do	Jan. 2–Feb. 19	9	1	
Indo-China				July 1–21, 1920: Cases, 107; deaths, 24.
Italy:				
Catania	Nov. 29–Dec. 5	1		In Province, Nov. 29–Dec. 25, 1920: Cases, 43. Jan. 3–10, 1921: Cases, 32. Jan. 17–Feb. 20, 1921: Cases, 71.
Do	Feb. 14–Mar. 12	11		
Genoa	Feb. 7–13	3		
Messina (city and Province)	Jan. 3–Mar. 6	37	4	Dec. 5, 1920–Jan. 16, 1921: Cases, 25.
Palermo	Oct. 30–Dec. 27	410	124	
Do	Jan. 26–Mar. 8	238	35	
Java:				
West Java				Nov. 12–Dec. 29, 1920: Cases, 72; deaths, 6. Jan. 6–12, 1921: One case, one death.
Bandoeng	Nov. 19–25	1	1	
Do	Feb. 3–9	1	1	
Batavia	Nov. 12–Dec. 25	14	5	
Do	Jan. 27–Feb. 9	3	2	
Garoet	do	1		
Indramayoe	Nov. 12–Dec. 29	1		
Krawang	do	1		
Do	Jan. 13–Feb. 2	26	7	
Lebak	Jan. 13–Feb. 9	24	9	
Pandeglang	Jan. 27–Feb. 2	6	2	
Jugoslavia	July 25–Aug. 28	128	42	Feb. 7–13, 1920: Cases, 122; deaths, 27.
Zagreb	Jan. 9–Feb. 19	3	1	
Luxembourg	Dec. 15–Jan. 1	1		
Madagascar:				
Tananarive	Jan. 17–23		2	
Madeira:				
Funchal	Dec. 5–18		2	
Do	Dec. 26–Mar. 12		8	
Mesopotamia:				
Bagdad	Nov. 1–Dec. 31	2		
Do	Jan. 1–31	1	2	
Mexico:				
Chihuahua	Dec. 6–26	11	3	
Do	Dec. 27–Mar. 13		15	
Ciudad Juarez	Mar. 21–27		1	
Guadalajara	Dec. 1–31	1		
Do	Jan. 1–31	1		
Mexico City	Nov. 14–Dec. 25	17		Including municipalities in the Federal district.
Do	Jan. 2–Mar. 5	81		Do.
Salina Cruz	Jan. 1–Feb. 28	4		
San Luis Potosi	Feb. 6–12		1	
Tecate	Jan. 17	3		
Torreon	Jan. 1–Feb. 28	6	3	
Newfoundland:				
Grand Falls	Mar. 12–18	1		
St. Johns	Jan. 22–26	1		
Norway:				
Stavanger	Jan. 23–29	3		
Panama:				
Colon	Jan. 2–Mar. 22	100		
Poland				Sept.–Oct., 1920: Cases, 175; deaths, 37.
Warsaw	Sept. 1–30	3		
Portugal:				
Lisbon	Nov. 28–Dec. 18		5	
Do	Dec. 26–Feb. 26		12	
Portuguese East Africa:				
Gaza district	Dec. 18–23			Present.
Inhambane district	Dec. 26–Jan. 1			Do.
Lourenco Marques	Oct. 24–Dec. 11	10		Reported present in interior of Chai-Chai district.
Quelimane	do	3		
Roumania:				
Kisseneff	Jan. 1–Mar. 18	18		District.
Russia:				
Esthonia Province				Dec. 1–31, 1920: Cases, 17.
Reval	Oct. 1–Nov. 30	28		
Latvia—				
Riga	Nov. 1–Dec. 31	17		
Siberia—				
Vladivostok	Oct. 1–Nov. 30	2	1	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.

Reports Received from Jan. 1 to Apr. 15, 1921—Continued.

SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Spain:				
Barcelona	Nov. 18–Dec. 29		13	
Do	Jan. 13–Mar. 2		21	
Corunna	Dec. 12–18		1	
Madrid	Nov. 1–30		1	Year ended Dec. 31, 1920: Deaths, 9.
Do	Feb. 6–13		1	
Malaga	Oct. 1–Dec. 31		77	
Do	Jan. 1–Feb. 28		32	
Tarragona	Jan. 30–Feb. 19		2	
Valencia	Dec. 5–25	3		
Do	Dec. 26–Feb. 26	15	1	
Syria:				
Aleppo	Nov. 14–Dec. 4			Dec. 12–25, 1920: Present.
Do	Jan. 16–Feb. 5			Present.
Tunis:				
Tunis	Nov. 30–Dec. 28	10	18	
Do	Jan. 8–Mar. 11	44	25	
Turkey:				
Constantinople	Nov. 21–Dec. 11	4		
Do	Jan. 2–Mar. 5	18		
Union of South Africa	Feb. 20–26			Fresh outbreaks, States of Natal, Orange Free State, and Transvaal.
Cape Province	Jan. 23–Feb. 5			Outbreaks.
Natal				Feb. 13–19, 1921: Present in rural areas.
Durban district	Jan. 23–Feb. 5			Outbreak.
Orange Free State	do			Outbreaks. Feb. 13–19, 1921: Present in rural area.
Transvaal				Jan. 23–Feb. 5, 1921: Outbreak in one district.
Johannesburg	Oct. 1–31	1		
Do	Feb. 13–19	2		From Portuguese East Africa.
Uruguay:				
Montevideo	Dec. 1–31	6	2	
On vessels:				
S. S. Alfonso XIII	Dec. 27	1		At Habana, Cuba, from ports in northern Spain.
S. S. Cadiz	Jan. 5	1		At Habana, Cuba, from Mediterranean ports.
U. S. S. Mississippi	Feb. 18–20	22		In Canal Zone.
S. S. Ohioan	Jan. 4	1		At San Pedro, Calif., from New York, via Balboa, Canal Zone.
S. S. Ventura	Jan. 18	1		At Sydney, Australia, from San Francisco, Calif., via Honolulu, and Pago Pago, Samoa.

TYPHUS FEVER.

Algeria:				
Algiers	Jan. 1–Feb. 28	6	1	
Belgium:				
Ghent	Dec. 12–18	5		
Bolivia:				
La Paz	Dec. 1–31	13	9	
Brazil:				
Ceara	Oct. 17–Dec. 26		3	
Do	Jan. 2–29		5	
Bulgaria:				
Sofia	Jan. 2–Feb. 19	3		
Chile:				
Concepcion	Nov. 1–Dec. 27		23	
Do	Dec. 28–Feb. 20		9	Present in vicinity. Year 1920; in public hospital, 89 cases, 13 deaths.
Coquimbo	Dec. 1–7		1	
Valparaiso	Oct. 25–Nov. 27		13	
Do	Jan. 30–Feb. 19		5	
China:				
Manchuria (Province)–				
Harbin	Nov. 22–28	1		On Chinese Eastern Railway.
Do	Jan. 3–9	1		
Manchuria Station	Nov. 22–28	2		Do.
Do	Jan. 10–16	1		
Chosen (Korea):				
Seoul	Dec. 1–31	1		
Do	Jan. 1–31	1		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.

Reports Received from Jan. 1 to Apr. 15, 1921—Continued.

TYPHUS FEVER—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Czechoslovakia				July 11–Aug. 28, 1920: Cases, 138; deaths, 18. Reported present Feb. 19, 1921.
Prague	Feb. 1–21	2		
Danzig	Dec. 20	1		In emigrant from Brest-Litovsk with 2 weeks' stay at Warsaw.
Do	Jan. 16–Feb. 5	3	1	
Egypt:				
Alexandria	Nov. 19–Dec. 31	13	6	
Do	Jan. 1–Mar. 4	14	6	
Cairo	Oct. 1–Dec. 28	44	32	
Do	Jan. 1–21	15	12	
Germany				Sept. 12–Dec. 25, 1920: Cases, 259, including 11 in a camp. Dec. 26, 1920–Jan. 8, 1921: Cases, 7.
Great Britain:				
Belfast	Dec. 5–25	13		
Do	Jan. 9–Feb. 26	6	1	
Dublin	Nov. 28–Dec. 18	4	3	
Do	Jan. 9–Mar. 5	11	2	
Greece:				
Drama	Nov. 22–28	1		
Patras	Nov. 29–Dec. 5		1	
Saloniki	Oct. 25–Dec. 25	31	9	
Do	Jan. 10–Feb. 5	354	5	Among refugees from Russia.
Serres	Nov. 8–14	1		Present among Caucasian refugees in vicinity.
Guatemala				Feb. 1–Mar. 12 1921: Present in highland departments.
Guatemala City	Mar. 1–12		1	
Hungary				Aug. 3–Dec. 5, 1920: Cases, 38.
Budapest	Nov. 8–Dec. 5	2		
Italy:				
Naples	Feb. 23	2		
Trieste	Feb. 14	30		Among emigrants intending to come to United States.
Japan:				
Nagasaki	Nov. 15–Dec. 26	10	1	
Do	Dec. 27–Feb. 27	13	5	
Jugoslavia	July 25–Aug. 28	27	5	Feb. 7–13, 1920: Cases, 81; deaths, 2. Dec. 12–25, 1920: Cases, 112.
Belgrade	Jan. 9–22	2		114 remaining cases.
Medjumurju Province	Jan. 2–8	73		51 remaining cases.
Do	Feb. 13–19	42		
Zagreb	Dec. 12–25	27		
Do	Dec. 26–Feb. 21	41	6	City and county.
Malta	Dec. 1–31	1		
Mesopotamia:				
Bagdad	Nov. 1–30	1	1	
Mexico:				
Guadalajara	Dec. 1–31	11		
Do	Jan. 1–31	6	3	
Mexico City	Nov. 14–Dec. 25	67		Including municipalities in the Federal district.
Do	Dec. 26–Mar. 5	129		Do.
San Luis Potosi	Dec. 5–31			Present.
Do	Jan. 16–Mar. 26		3	Dec. 26–Mar. 26, 1921: Present.
Netherlands:				
Rotterdam	Jan. 23–29	1		
Poland				Sept.–Oct., 1920: Cases, 3,845; deaths, 371. Nov. 1–30, 1920 Cases, 3,059; deaths, 350. Dec. 1–31, 1920: Cases, 4,644; deaths, 550. Jan. 1–31, 1921: Cases, 5,308; deaths, 597.
District—				
Galicia	Nov. 1–30	1,192	286	
Kielce	do	279	15	
Lodz	do	83	6	
Lublin	do	403	20	
Posen	do	17		
Silesia	do	6		
Warsaw	do	191	15	
Warsaw city	Nov. 1–Dec. 16	96	8	
District—				
Bialystok	Jan. 1–31	321	33	
Galicia	do	3,427	457	
Kielce	do	426	42	
Lodz	do	200	14	
Lublin	do	383	18	
Posen	do	13		
Silesia	do	1		
Warsaw	do	340	16	
Warsaw city	do	197	17	
Portugal:				
Oporto	Nov. 28–Dec. 4	1		
Do	Dec. 26–Jan. 1	3	1	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.

Reports Received from Jan. 1 to Apr. 15, 1921—Continued.

TYPHUS FEVER—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Russia:				
Province—				
Esthonia				Sept. 1-Dec. 31, 1920: Cases, 455.
Latvia—				
Riga	Nov. 1-Dec. 31	185		
Do	Jan. 1-7	21		
Lithuania				Feb. 19, 1921: Cases, 175; mortality, 5 to 6 per cent.
Ruthenia				Feb. 19, 1921: Occurence of about 5 fatal cases daily. Mar. 5, 1921: 200 fatal cases previously unreported.
Ukraine				Feb. 19, 1921: Occurrence of about 5 fatal cases daily.
Siberia—				
Vladivostok	Jan. 1-31	1	6	
Turkey:				
Constantinople	Nov. 21-Dec. 25	25	1	
Do	Jan. 2-Mar. 12	45		
Union of South Africa:				
Cape Province				Feb. 13-19, 1921: Outbreaks reported.
Cape Town	Dec 20-26	16	5	
East London	Jan. 29-Feb. 12	5	3	
Port Elizabeth	Jan. 30-Feb. 5	1		
Natal	Feb. 13-19			Outbreak.
Orange Free State	Jan. 23-Feb. 5			Outbreaks.
Transvaal—				
Johannesburg	do	1		District.
On vessels:				
S. S. Presidente Wilson	Feb. 1-6	15		At New York. From Trieste, Italy, Jan. 15; Naples, Jan. 18; and Algiers, Jan. 22, 1921.
S. S. San Giusto	Feb. 10-Mar. 3	22		At New York. From Trieste, Jan. 23, and Naples, Jan. 26, 1921.

YELLOW FEVER.

Brazil:				
Pernambuco	Nov. 14-21	1	1	
Mexico:				
Orizaba	Dec. 5-18	2	1	
Papantla	do	8	2	
Do	Jan. 9-15		1	
Tampico	Dec. 12-18	1	1	
Tuxpam	Dec. 5-18	9	4	
Do	Dec. 26-Jan. 1	5	1	
Vera Cruz	Dec. 5-25	8	3	
Do	Dec. 26-Mar. 20	6	1	
Zamora	Dec. 12-18	1	1	Also called Gutierrez, State of Vera Cruz.
Peru:				
Department—				
Lambayeque				Outbreak reported Jan. 22, 1921.
Chiclayo	Feb. 1-28	18	6	
Eten	do	7	2	
Ferrenafe	Jan. 1-31	18	17	
Do	Feb. 1-28	44	19	
Lambayeque	Jan. 1-31	2	1	
Do	Feb. 1-28	4		
Monsefu	Feb. 16-28	2		
On vessel:				
S. S. Savoia	Jan. 11-15	4		At Habana, Cuba, from Vera Cruz, Mexico. Vessel arrived Habana, Jan. 10. 1920, with three cases sickness on board. Two cases confirmed. Two cases developed later on board; confirmed Jan. 15. Savoia left Vera Cruz Jan. 6, 1921.

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